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CHAPTER 6. IMPLEMENTATION PLAN

6.1 Introduction

The TMDL Program is the primary program responsible for achieving clean water where traditional controls on point sources have proven inadequate to do so. The program thus is charged with creating plans that consider all sources and causes of impairment, and allocating responsibility for corrective measures, regardless of sources or cause, that will attain water quality standards. The Klamath River TMDL implementation plan implements the load allocations and targets developed as part of the technical TMDL analysis to meet water quality standards in the Klamath River in California. It identifies the parties responsible for controlling pollutant discharges to meet the TMDL and recommends implementation measures for adoption into the Regional Water Board Basin Plan as the Klamath River TMDL Action Plan. The measures include regulatory actions for the Regional Water Board to take to implement and enforce the TMDL, and measures required of the responsible parties. In developing the implementation plan, the Regional Water Board staff considered the nature of the discharges in the Klamath River basin as well as existing efforts to protect and restore water quality in the basin. The plan sets time schedules by which the responsible parties will implement their compliance measures and also includes a monitoring plan to track progress towards compliance. The Regional Water Board will adaptively manage TMDL implementation by periodically reviewing monitoring data and discharger reports and make any necessary revisions to the TMDL and/or implementation program.

6.1.1 Basin-Wide TMDL Implementation

Restoration of water quality of the Klamath River requires coordinated basin-wide implementation of TMDLs. The primary elements for successful restoration of water quality conditions in the basin include:

- Reduction of point and nonpoint source nutrient loads in Oregon and California;
- Protection of thermal refugia; and
- Addressing the water quality impacts from the Klamath Hydroelectric Project.

Achieving compliance with the Klamath River TMDLs in both states will require a coordinated approach that involves state and federal agencies as well as responsible parties in California and Oregon. To this end, the Regional Water Board, Oregon Department of Environmental Quality (ODEQ), and USEPA Regions 9 and 10 have signed a Memorandum of Agreement (MOA) for implementing the Klamath River basin TMDLs.

Coordinating implementation will focus restoration and regulatory programs on both short-term and long-term goals for the basin. Short-term measures are needed to immediately lessen the threat to cold water fishery and tribal cultural beneficial uses, among others. The regulatory process will accommodate short-term measures working in concert with longer-term programs to achieve full compliance over a longer time frame. Regional Water Board staff encourage implementation of large scale, centralized projects

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designed to reduce nutrient loads to the Klamath River in Oregon and California. Fundamental for the control of nutrient loads to the Klamath River is coordinating with the U.S. Bureau of Reclamation (USBR) to address discharges from the Klamath Irrigation Project. To this end, Regional Water Board staff propose development of a Memorandum of Agency Agreement with USBR to control discharges to the Klamath River. In addition, Regional Water Board staff are working with ODEQ and USEPA Regions 9 and 10 in cooperation with PacifiCorp to develop a Klamath basin water quality improvement accounting and tracking program (KlamTrack). As planned, the KlamTrack Program will provide a mechanism that would allow for collaboration among basin stakeholders on common projects while earning credit towards their regulatory requirements related to TMDLs (See Section 6.7).

6.1.2 Klamath Hydroelectric Project, Klamath Basin Restoration Agreement, and Dam Removal Agreement

The Klamath River TMDLs assign load allocations and targets at levels necessary to achieve water quality standards within the Klamath Hydroelectric Project (KHP) area. Regulation and enforcement of the TMDL allocations is traditionally through the State Water Board water quality certification process that accompanies renewal of a license issued by the Federal Energy Regulatory Commission (FERC). As described in more detail below, certain parties have been engaged in settlement negotiations that contemplate the voluntary removal of the KHP. Because the regulatory process and outcome of the settlement negotiations is largely outside of the Regional Water Board's control, the Klamath River TMDLs accommodate various alternatives.

The Klamath Basin Restoration Agreement (KBRA) is a negotiated settlement agreement among as many as 26 different parties and is designed to settle long-standing disputes in the Klamath River basin. It focuses on water allocations in the upper basin, provides for fisheries restoration, and is structured around the central assumption that an agreement to remove the lower four Klamath River dams will be reached. On November 13, 2008, an Agreement in Principle (AIP) to remove four Klamath River dams was announced after negotiations among representatives of the federal government, the state of California, the state of Oregon, and PacifiCorp. The Regional Water Board was not a party to the KBRA or AIP negotiations. The final agreement may affect the TMDL implementation schedule for the Klamath Hydroelectric Project, which relies on the FERC relicensing process and subsequent water quality certification by the State Water Board. As currently drafted, the AIP contemplates federal legislation that would allow PacifiCorp to remain on annual licenses from FERC, thereby indefinitely delaying the 401 certification and Clean Water Act compliance. The Regional Water Board directed staff to monitor settlement developments and staff have provided input to the parties on appropriate interim water quality measures. Staff will continue to monitor settlement developments and provide input to the parties on appropriate interim water quality measures. Regardless of the process, PacifiCorp must implement measures designed to move toward compliance with TMDL allocations and protection of beneficial uses.

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6.1.3 Nonpoint Source Land Use Activities and Controls

The threats to water quality from nonpoint source activities in the Klamath River basin are mainly associated with timber harvest, roads, grazing, and irrigated agriculture on private and federal lands. The implementation plan focuses on reducing nutrient loading in the upper basin, controlling sediment discharges, and protecting riparian vegetation in the tributaries downstream of Iron Gate Dam in accordance with the technical TMDL allocations. The implementation plan proposes a prohibition on the discharge of excess sediment to address all sediment sources in the Klamath River basin not currently regulated through an existing permit or conditional waiver. The implementation plan also proposes a prohibition on the discharge of waste in and around known thermal refugia locations in the Klamath River in California to protect their function in mitigating adverse water quality conditions.

With the exception of existing waste discharge requirements (WDRs) and waivers for timber harvest and TMDL waivers adopted as part of the Scott and Shasta River TMDLs, the Regional Water Board has not adopted regulatory mechanisms that make the Klamath River TMDL requirements enforceable. To address this gap in regulation, the implementation plan recommends development of several new conditional waivers and/or WDRs for controlling discharges from land use activities that contribute to the water quality impairments. To ensure the TMDL is enforceable until those permits are developed, it is recommended that the Regional Water Board adopt a conditional waiver for all parties that comply with the TMDL implementation plan, similar to the waivers adopted as part of the Scott and Shasta TMDL implementation plans. Tables 6.1 and 6.2 provide an overview of the Regional Water Board staff recommendations of regulatory mechanisms to implement the TMDL allocations for nonpoint sources of pollution in the Klamath River basin in California detailed in Section 6.5.

Table 6.1: Nonpoint Source Regulatory Mechanisms for Implementation of Klamath River TMDLs

Allocation Addressed	Nonpoint Source Regulatory Mechanisms (Timeframe for Development)						
	Prohibition on the Discharge of Excess Sediment (proposed with TMDL)	Thermal Refugia Prohibition (proposed with TMDL)	Timber harvest WDRs and waiver on Nonfederal Lands (Existing)	Waiver for timber harvest on federal lands (2009 update)	USFS WDRs/ Waiver for all activities (2011-2013)	Grazing waiver/ WDRs (2013)	Irrigated Ag waiver/ WDRs (2012)
Temperature - Riparian Shade		x	x	x	x	x	x
Temperature - Excess Sediment	x	x	x	x	x	x	x
Nutrients & Organic Matter					x	x	x

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Table 6.2: Responsible Parties for Implementation of Nonpoint Source Regulatory Mechanisms

Nonpoint Source Regulatory Mechanism	Existing/New/Revised (Timeframe)	Responsible Party
Prohibition on the Discharge of Excess Sediment	New (proposed with TMDL)	All parties responsible for controlling the discharge of excess sediment waste
Thermal Refugia Prohibition	New (proposed with TMDL)	All parties conducting activities within known areas of thermal refugia that are not already regulated through another mechanism
Timber Harvest WDRs and waiver on Nonfederal lands	Existing	All parties conducting timber harvest activities on nonfederal lands in the Klamath River basin
Timber Harvest waiver on federal lands	Existing (to be updated in 2009)	USFS, BLM
Waiver for other activities on federal land	New (2011-2013)	USFS, BLM
Grazing waiver/ WDRs	New (2013)	All parties conducting grazing activities in the Klamath River basin in California
Irrigated Ag waiver/ WDRs	New (2012)	All parties conducting activities associated with irrigated agriculture in the Klamath River basin in California

6.1.4 Regulatory Requirements of TMDL Implementation Plans

The TMDL establishes the allowable loadings or other quantifiable parameters for a waterbody that is the total permissible pollutant load that will achieve water quality standards. This “loading capacity” provides a reference for calculating the amount of pollutant reduction needed to bring a waterbody into compliance with water quality standards or designated uses. The TMDL identifies and assigns allocations to all sources of pollution, including waste load allocations (WLA) for point sources and load allocations (LA) to nonpoint sources (40 CFR § 130.2(i)). A wasteload allocation (WLA) is defined as “[t]he portion of a receiving water’s loading capacity that is allocated to one of its existing or future point sources of pollution”. WLAs constitute a type of water quality-based effluent limitation (40 CFR § 130.2(h)). A load allocation is defined as “[t]he portion of a receiving water’s loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources” (40 CFR § 130.2(g)). Wherever possible, natural and nonpoint source loads should be distinguished. The rationale for the allocations and targets is provided in detail in Chapters 2 through 5 of the TMDL Staff Report.

The Klamath River TMDL must be accompanied by an implementation plan pursuant to Water Code section 13242. The implementation plan translates the information in the technical TMDL into discrete and identifiable actions that will bring the waterbody into compliance. This chapter of the staff report describes the elements of the Klamath River TMDL implementation plan proposed for adoption into the Regional Water Board Basin Plan. It describes the Regional Water Board’s current regulatory strategy for controlling source inputs, recommends improvements to existing regulatory controls, and describes the recommended approach to controlling pollutant sources where traditional

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implementation controls may not apply or where the Regional Water Board lacks implementing jurisdiction.

All dischargers of waste are responsible for the quality of their waste and are responsible for ensuring that discharges meet TMDL allocations and targets and do not adversely impact the beneficial uses of waters of the State. TMDL implementation essentially requires that responsible parties discharging pollutants in the Klamath River basin implement management practices that control their discharges and document water quality improvements. The implementation plan specifies: 1) implementation actions required of responsible parties and recommended for implementation by other agencies; and 2) time schedules for actions to be taken. The TMDL Monitoring Plan (Chapter 7) details the monitoring and compliance tracking to be undertaken to determine progress toward attaining water quality standards.

6.1.5 Regulatory Tools

All point source discharges of pollutants to surface waters require a National Pollutant Discharge Elimination System (NPDES) permit under section 402 of the Clean Water Act. NPDES permits typically regulate the discharge of treated sewage, stormwater, and other pollutants discharged through a discrete conveyance such as a pipe, ditch or channel. An NPDES permit contains effluent limitations based on applicable technology and water quality standards. WLAs constitute a type of water quality-based effluent limitation (40 CFR § 130.2(h)), which triggers certain procedural and substantive legal requirements. For example, federal regulations require NPDES permits to be consistent with any WLAs in an EPA-approved TMDL (40 CFR § 122.44(d)(1)(vii)(B); see also *Friends of Pinto Creek v. United States Environmental Protection Agency* (9th Cir. 2007) 504 F.3d 1007). Under Clean Water Act section 402(d), a downstream state has certain procedural remedies against an upstream source state's issuance of NPDES permits that may adversely impact that state's water quality standards. An NPDES permit shall not be issued "[w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States." (40 CFR § 122.4(d))

In California, discharges of waste that are not NPDES "discharges of pollutants" require the issuance of waste discharge requirements (WDRs) unless otherwise waived. Discharges of waste that are not subject to NPDES permits typically include runoff from nonpoint sources such as agricultural activities and waste discharges to land or to groundwater. For non-NPDES discharges, the Water Code generally does not dictate specific effluent limits. WDRs prescribe requirements, such as limitations on temperature, toxicity, or pollutant levels, as to the nature of any discharge (Wat. Code, § 13260, subd. (a)). WDRs may also specify conditions where no discharge will be permitted, (*Id.*, § 13241), and may also include monitoring and reporting requirements (See *id.* § 13267, Cal. Code Regs., tit. 23, § 2230). WDRs implement the Basin Plan, taking into consideration the beneficial uses to be protected, and water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisance. (Wat. Code, § 13263, subd. (a)). The general regulatory scheme provides flexibility to dischargers in choosing the methods they will implement to meet the requirements of the Porter-Cologne Act. (See, e.g., Wat. Code, § 13360 [preventing the

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water boards from specifying the manner of compliance].) If Best Management Practices (BMPs) or other nonpoint source pollution controls make more stringent load allocations practicable, then WLAs for NPDES dischargers can be made less stringent, or vice versa. Thus, the TMDL process provides for nonpoint and point source control tradeoffs (40 C FR § 130.2(i)).

Other existing regulatory tools include individual or general waivers of waste discharge requirements, Basin Plan prohibitions, and enforcement actions. Under Water Code section 13301, the Regional Water Board may issue a cease and desist order (CDO) if it finds a discharge or threatened discharge of waste in violation of waste discharge requirements or prohibitions. Under Water Code section 13304, the Regional Water Board may issue a clean up and abatement order (CAO) to any person who has discharged or discharges waste into waters of the state, or who has caused or permitted, or threatens to cause or permit waste to be discharged or deposited where it will be discharged, or threatens to create a condition of pollution or nuisance. Civil monetary remedies may be pursued for violations of WDRs, waivers, prohibitions, CDOs, CAOs, and other orders (See e.g. Wat. Code, §13350). Projects that require federal approval must be accompanied by water quality certification from the State pursuant to Clean Water Act section 401, even in cases where state law is preempted. If the project involves water rights, typically the State Water Board is responsible for issuing the water quality certification.

The Regional Water Boards can formally recognize regulatory or nonregulatory actions of other entities as appropriate implementation programs when the Regional Water Boards determine those actions will result in attainment of standards. For discharges of waste and other source inputs within Regional Water Board jurisdiction, this may be accomplished by a certification process that is accompanied by a waiver and includes a monitoring plan, conditions that require trackable progress, and a provision setting forth that certification and waiver must be revoked if the program is found to be not adequately implemented, not achieving its goals, or is no longer adequate to restore water quality.

6.1.5.1 State Nonpoint Source Policy

Implementation actions taken to achieve load allocations must be consistent with the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (State NPS Policy). This policy requires that “all current and proposed nonpoint source discharges must be regulated under waste discharge requirements (WDRs), waivers of WDRs, a Basin Plan prohibition, or some combination of these tools (Regional Water Board 2007, p.4-33.00).” For some pollutant sources, the method of compliance with this policy is already in place, and if it is determined to be sufficient, no further action by the Regional Water Board is necessary. However, if the source is currently unregulated, or the current permits, waivers and/or prohibitions are not sufficient to attain the TMDL, a means to comply with the NPS Policy must be proposed as part of the implementation plan.

Several factors are involved in the decision of which regulatory mechanism is appropriate to control a given source of pollution. For example, individual WDRs require the

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discharger to submit a formal report of waste discharge with a fee. General WDRs can be used to regulate large numbers of dischargers at once if the discharger falls within a specific category. For example, the Regional Water Board utilizes general WDRs to control discharges from timber harvest activities on nonfederal lands. While general WDRs may not require a report of waste discharge, they always require a fee. Waivers of waste discharge requirements do not require a report of waste discharge, however the discharger may be required to submit a Notice of Intent to comply with the conditions of the waiver. The conditions included in the waivers are intended to control the allowable discharge so that it does not impact beneficial uses. Like general WDRs, waivers may apply to a category of discharges, but do not carry a mandatory fee. Waivers of waste discharge are currently being utilized by the Central Valley Regional Water Board to control discharges from irrigated lands. Prohibitions are typically used when the discharger category is not well defined and the overall threat to water quality is less severe. The Regional Water Board is not limited to choosing one means of regulation; a combination of regulatory mechanisms may be employed to control a certain category of discharges, as is currently being done, for example, to control sediment discharges from timber harvest activities in the North Coast Region. The implementation plan will include Regional Water Board actions to effectively implement the TMDL and be consistent with the State NPS Policy.

6.1.6 Implementation Plan Organization

This implementation chapter is organized according to the source areas identified in the technical TMDL. Each section provides a summary of the load allocations and targets for that source area, identifies the parties responsible for meeting those allocations, and discusses the Regional Water Board staff's approach to implementation and recommended implementation actions for the responsible parties.

The source areas receiving allocations and targets are:

1. Stateline (Section 6.2)
2. Klamath Hydroelectric Project (KHP) and Iron Gate Hatchery (Section 6.3)
3. Klamath River tributaries (Section 6.4)
4. Watershed-wide (Section 6.5)

Key components for implementing the watershed-wide allocations and targets include: 1) a watershed-wide prohibition on the discharge of excess sediment, and 2) measures to protect thermal refugia in the Klamath River basin, including a prohibition of discharge in and around known thermal refugia in the Klamath River basin in California. The presentation of the watershed-wide implementation actions in Section 6.5 begins with a description of these prohibitions, followed by discussion of the following land use activities:

- Road construction and maintenance;
- Grazing;
- Irrigated agriculture; and
- Timber harvest.

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Implementation actions associated with all land use activities of federally managed lands are presented in Section 6.6. The Klamath River water quality improvement accounting and tracking program (KlamTrack) is described in Section 6.7.

6.2 Implementation of Allocations and Targets - Stateline

The Oregon-California stateline (stateline) is the point at which the Klamath River crosses the Oregon-California border, and is designated as a compliance point in the Klamath TMDL. The pollutant loads in the Klamath River entering California are the result of loadings in Oregon, including the Lost River basin, which is partially in California. Nutrient loads in the Klamath River at stateline originate mainly from Upper Klamath Lake, as well as from the Lost River basin through the Klamath Straits Drain, and to a lesser extent from point sources in Oregon. Nutrients coming from these sources contribute to DO and pH swings downstream, as well as to aquatic plant growth within the river and blue-green algae blooms within the Copco and Iron Gate reservoirs in California.

6.2.1 Allocations and Targets

The ODEQ has identified the Klamath River in Oregon on its CWA section 303(d) list as failing to meet Oregon water quality criteria. Accordingly, in 2009, ODEQ intends to issue and implement TMDLs addressing temperature, dissolved oxygen, pH, ammonia, and chlorophyll-a impairments for the Klamath River in the state of Oregon. These Oregon-issued TMDLs will be based on Oregon's water quality standards. Because these TMDLs (and their anticipated load and wasteload allocations) are being developed by Oregon as part of a comprehensive multistate analysis of pollutant loadings to the Klamath River, they are also being designed to meet California water quality standards at stateline. It is appropriate for the Regional Water Board to account for these anticipated upstream load reductions in Oregon when developing the TMDLs for the segments of the Klamath River that are downstream in California. The Regional Water Board's Klamath River TMDLs for California assign nutrient, organic matter, and temperature allocations, as well as temperature and dissolved oxygen targets at stateline. These allocations and targets at stateline are presented in Sections 5.2.2 and 5.3.1 and reflect anticipated water quality at stateline once the Oregon TMDLs are fully implemented. Improvements in water quality in Oregon represent a critical part of the solution in meeting water quality objectives in California.

6.2.2 Responsible Parties

Point and Nonpoint Sources in Oregon and Lost River basin in California
Regional Water Board
Oregon Department of Environmental Quality
Oregon Department of Agriculture
USEPA Regions 9 and 10

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6.2.3 Implementation

6.2.3.1 Oregon

Consistent with Oregon Administrative Rules (OARs), ODEQ is responsible for developing an implementation plan, called a Water Quality Management Plan (WQMP), to meet the Klamath and Lost River TMDLs in Oregon. The OARs establish the required elements of WQMPs, which include the following:

- Identification of management measures to meet load allocations;
- A timeline for implementation with measureable milestones;
- A timeline for attainment of water quality standards;
- A monitoring plan; and
- General discussion of costs and funding for implementation.

The OARs also require the WQMP to identify persons and agencies responsible for implementation; as well as provide reasonable assurance that implementation will occur through either regulatory or voluntary means. A main difference between TMDL implementation planning in Oregon and California is that ODEQ does not specify the nature of the actions responsible parties are expected to take and is not charged with enforcing the TMDL load allocations and targets directly. Instead, ODEQ implementation plan designates management agencies (DMAs) that must develop ‘sector or source specific’ implementation plans (also called WQMPs) that meet the TMDL load allocations. DMA’s designated in ODEQ’s TMDL will likely include USBR, Oregon Department of Agriculture, and the Irrigation Districts. The WQMPs are subject to approval by ODEQ, but the DMAs maintain the primary authority to enforce the measures in those plans.

Oregon Department of Agricultural Water Quality Program

ODA fulfills the requirement to develop a WQMP through an existing program established by Oregon Senate Bill 1010. SB 1010 requires ODA to develop administrative rules specific to hydrologic ‘subareas’ in Oregon. The administrative rules describe water quality requirements for landowners and consist of a description of the subarea, a list of unacceptable water quality conditions, and a process for complaints and investigations. The unacceptable conditions include excessive sheet and rill erosion and downward trending riparian conditions as defined by US Bureau of Land Management (BLM) technical guidelines. Landowners are also prohibited from degrading stream shading consistent with site capability – similar to the California riparian shade allocation.

Landowners are directed by Oregon Senate Bill 1010 to develop Agricultural Water Quality Management Plans that implement the administrative rules and control water pollution resulting from agricultural activities. A Local Advisory Committee typically represents the landowners in development of both the area administrative rules and the management area plans with oversight by the Oregon Department of Agriculture. The area management plans include provisions for ODEQ to work with ODA to monitor progress towards plan implementation including the effectiveness of the plan in meeting

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applicable TMDL load allocations. The rules are enforceable, while the plans are not. The plan in the Lost River basin in Oregon is called the Lost River Subarea Agricultural WQMP and is implemented by the Klamath Soil and Water Conservation District (KSWCD).

ODA maintains primary authority to regulate agriculture to protect water quality. Since ODEQ authority is secondary, it is important for ODA to effectively use its authority in order to achieve the Klamath and Lost River TMDL load allocations and targets in Oregon with oversight by ODEQ. The strength of Oregon's agricultural water quality management program is its focus on landowner driven efforts. By working with the KSWCD in the Lost River basin, landowners have implemented management measures and water quality improvement projects that address the TMDL pollutants. It is important for ODA to continue to use its authority as appropriate to achieve the Klamath and Lost River TMDL load allocations and targets in Oregon. Regional Water Board staff support the following measures to coordinate the Oregon SB 1010 water quality program with TMDL implementation:

- Update the Oregon Administrative Rules for the Lost River subbasin Area to address nutrients and organic matter in irrigation tailwater;
- Incorporate TMDL implementation measures into the Lost River Agricultural Water Quality Management Plan;
- Conduct water quality monitoring to track the progress of TMDL implementation towards meeting allocations and targets; and
- Periodic review by ODA and ODEQ to ensure the TMDL requirements are being met.

6.2.3.2 Regional Water Board's Role

The Regional Water Board intends to work closely with ODEQ and ODA in implementing the Klamath and Lost River TMDLs. One of the purposes of coordination with Oregon is to align each states' approach to controlling nonpoint sources of pollution. Currently, the major difference between the states is the regulatory framework and the enforcement authorities of the water quality control agencies in each state. In California, the Regional Water Board is required by the State NPS Policy to regulate all sources of waste, including agricultural activities, directly through permits, waivers and/or prohibitions, as discussed in Section 6.1.5.1. The Regional Water Board has broad enforcement capabilities to ensure compliance with the terms and conditions of permits and prohibitions. While the Regional Water Board's regulatory authority is broader than ODEQ's, the implementation measures required to achieve the TMDL are similar in both states. For irrigators and ranchers in the Lost River basin, compliance is achieved in either state by selecting and implementing best management practices to control pollutant sources on their lands. For the USBR and USFWS, compliance involves the evaluation of methods to reduce the water quality impacts of the operation of the Klamath Irrigation Project and the Klamath River basin Wildlife Refuges and implementation of an effective pollutant reduction strategy. Implementation measures for USBR and USFWS are discussed in Section 6.4.3.3.

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6.2.3.3 Memorandum of Agreement to Coordinate State and Federal Agency TMDL Implementation Actions in the Klamath River Basin

Klamath TMDL implementation will be coordinated with the ODEQ and the USEPA. The Regional Water Board, ODEQ, and EPA Regions 9 and 10 have developed a Memorandum of Agreement (MOA) that establishes a framework for joint implementation of the Klamath River and Lost River TMDLs. The MOA includes commitments such as:

- Work to develop and implement a joint adaptive management program, including joint time frames for reviewing progress and considering adjustments to TMDLs;
- Work with the Klamath Basin Water Quality Monitoring Coordination Group and other appropriate entities to develop and implement basinwide monitoring programs designed to track progress, fill in data gaps, and provide a feedback loop for management actions on both sides of the common state border;
- Work jointly with common implementation parties (e.g., USBR, U.S. Forest Service, USFWS, BLM, PacifiCorp, and the Klamath Water Users Association (KWUA)) to develop effective implementation plans and achieve water quality standards;
- Explore centralized treatment options such as treatment wetlands, algae harvesting, and package wastewater treatment systems to reduce nutrient loads to the Klamath River and encourage implementation of these options where feasible; and
- Work to develop and implement a basinwide water quality accounting and tracking program that would establish a framework to track water quality improvements, facilitate planning and coordinated TMDL implementation, and enable appropriate water quality offsets or trades.

6.3 Implementation of Allocations and Targets - Klamath Hydroelectric Project and Iron Gate Hatchery

This section discusses the KHP and the Iron Gate Hatchery (IGH). These two facilities are being grouped together because IGH was built as mitigation for the KHP and because PacifiCorp is responsible for meeting TMDL allocations and targets assigned to both facilities.

6.3.1 *Klamath Hydroelectric Project*

The KHP is a federally licensed project owned and operated by PacifiCorp and consists of eight facilities in California and Oregon. The implementation plan will address the impacts of the project facilities in California, which includes the following three dam/reservoir pairs: Copco 1, Copco 2, and Iron Gate. Figure 6.1 shows all the dams on the Klamath River. All except Link River Dam are part of the KHP, and the Fall Creek Dam is located on Fall Creek, not the Klamath River.

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Figure 6.1: Map of Klamath Hydroelectric Project Facilities. Link River Dam is not part of KHP.

The technical TMDL analysis found that the KHP contributes to the impairment of the Klamath River by:

- Altering the nutrient dynamics of the river, and contributing to biostimulatory conditions in the summer/fall growing season;
- Creating physical conditions that promote nuisance blooms of suspended algae, including toxin-forming blue-green algae species;
- Creating low dissolved oxygen and high temperature conditions within the reservoirs and at the tailraces; and
- Altering the temperature regime in the Klamath River downstream.

6.3.1.1 Allocations and Targets

The TMDL includes allocations and targets for the KHP facilities in California. The allocations and targets assigned to meet water quality standards in the reservoirs include a temperature/DO compliance lens, nutrient allocations, as well as nutrient and organic matter targets, and algae-based targets. In addition, temperature allocations and temperature, DO, nutrient and organic matter targets are assigned to the reservoir tailraces. See Sections 5.2.3 and 5.3.2 for a complete discussion of these allocations and targets.

6.3.1.2 Responsible Parties

Regional Water Board

State Water Resources Control Board (State Water Board)

PacifiCorp

6.3.1.3 Implementation

To comply with the TMDL, PacifiCorp must implement management measures that result in attainment of the load allocations and targets to the KHP facilities in California. Regulation and enforcement of these TMDL allocations is traditionally through the State Water Board Clean Water Act section 401 water quality certification process, since the Regional Water Board is preempted from issuing a permit to the KHP. The KHP is

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licensed by the Federal Energy Regulatory Commission (FERC) with a license that expired on March 1, 2006. The KHP continues to operate under an annual license until renewal. Renewal of the license requires compliance with the California Environmental Quality Act (CEQA) and the issuance of a Clean Water Act section 401 water quality certification by the State Water Board. In issuing water quality certification, the state may impose conditions on the KHP in order to certify that the project protects beneficial uses and meets water quality objectives as specified in the Basin Plan. The Klamath TMDLs, upon adoption, will become part of the Basin Plan and will thus become part of the comprehensive plan that FERC must consider as part of its licensing decision. As authorized by section 401, the State Water Board will apply appropriate state water quality requirements through the FERC licensing proceeding as part of its decision to issue or deny water quality certification.

In 2004, FERC prepared a Final Environmental Impact Statement (FEIS) that describes the positive and negative environmental effects of the proposed action to relicense the continued operation of the KHP, and alternative actions, including decommissioning all or part of the project. As part of the 401 certification proceeding, the State Water Board is preparing an Environmental Impact Report (EIR) since the FEIS does not fully comply with CEQA (State Water Board 2008). The FEIS will form the basis of the EIR, and the State Water Board has initiated the process of soliciting information from stakeholders regarding the adequacy of the FEIS and the scope of the EIR. The EIR will evaluate four alternatives for operating the KHP, two of which include removal of two and four of the KHP dams, respectively. Regional Water Board staff will continue to participate in the FERC relicensing and 401 process at the State Water Board to provide information and consultation to ensure that the KHP meets water quality standards and other Basin Plan requirements.

On November 13, 2008, an Agreement in Principle (AIP) to remove four of the Klamath River dams (JC Boyle, Copco 1 and 2, and Iron Gate) was announced after negotiations between the representatives of the federal government, the state of California, the state of Oregon, and PacifiCorp. The Regional Water Board was not a party to the negotiations. The final agreement may affect the TMDL implementation schedule, which relies on the FERC relicensing process and subsequent water quality certification by the State Water Board. As currently drafted, the AIP contemplates federal legislation that would allow PacifiCorp to remain on annual licenses from FERC, thereby indefinitely delaying the 401 certification and Clean Water Act compliance. Staff will continue to monitor settlement developments and provide input to the parties on appropriate interim water quality measures. Demonstrable improvements are necessary for PacifiCorp to be on a path toward compliance with the Clean Water Act and the TMDLs.

The Klamath River TMDL is being developed to accommodate differing alternatives, and the implementation plan considers a variety of implementation options to address reservoir-related water quality impairments depending on whether the settlement moves forward or the State Water Board and FERC process continues. Regardless of the process, PacifiCorp must implement measures designed to move toward compliance with TMDL allocations and protection of beneficial uses. This is true for any process that

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proposes continued operation of the KHP, as well as for any alternative that considers dam removal. In addition, PacifiCorp must implement adequate water quality control measures to offset on-going reservoir impacts while the reservoirs are modified to meet the load allocations or, alternatively, up to the time they are decommissioned. Within 60 days from the date of TMDL adoption by the Regional Water Board, PacifiCorp shall submit a proposed implementation plan for approval by the Regional Water Board. While the timing for submittal to ODEQ and the Regional Water Board may differ, it is preferable that PacifiCorp follow one consistent TMDL implementation plan that meets both states' requirements to the extent consistent with their statutory and regulatory authorities. PacifiCorp may propose the use of offsite pollutant reduction measures in the interim period consistent with the Klamath River water quality improvement accounting and tracking program (see Section 6.7), subject to an iterative evaluation and approval process. The Regional Water Board will periodically review and may revise the TMDL implementation plans.

Implementation Measures

PacifiCorp:

Measure

- Submit a proposed implementation plan for approval by the Regional Water Board that includes implementation measures, a timeline for implementation, measureable milestones, and a provision to periodically update the plan.

Timeline

- Within 60 days from the date of TMDL adoption by the Regional Water Board

Measure

- Implement measures to meet and/or offset TMDL allocations and targets as prescribed in the approved implementation plan.

Timeline

- As required by the approved implementation plan.

State Water Board:

Measure

- Include measures to meet and/or offset Klamath TMDL allocations and targets as conditions of the 401 water quality certification that is part of the FERC licensing process for the KHP.

Timeline

- Pursuant to the FERC licensing process timeline.

Regional Water Board:

Measure

- Review the implementation plan submitted by PacifiCorp and make any revision necessary to meet and/or offset TMDL allocations and targets.

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6.3.2 Iron Gate Hatchery

Iron Gate Fish Hatchery is owned by PacifiCorp and operated by the California Department of Fish and Game (CDFG). The hatchery is located at the base of Iron Gate Dam and discharges effluent under NPDES Permit No. CA0006688 and WDR No. R1-2000-17.

6.3.2.1 Allocations and Targets

The TMDL assigns temperature, nutrient, and organic matter waste load allocations, as well as temperature, DO, nutrient and organic matter targets to discharges from Iron Gate Hatchery. These allocations and targets are presented in Sections 5.2.4 and 5.3.3.

6.3.2.2 Responsible Parties

Regional Water Board

PacifiCorp

California Department of Fish and Game

6.3.2.3 Implementation

The waste load allocations to the Iron Gate Hatchery discharges will be implemented through the federal NPDES permit, which is held jointly by CDFG and PacifiCorp. The current permit passed its expiration date in August 2004, and the hatchery continues to operate under the terms of the existing permit until a new permit is issued. The TMDL load allocations and targets to the hatchery discharge will be translated into effluent limits in the new NPDES permit. The TMDL compliance schedule to accompany the new permit may allow additional time needed for CDFG to make any infrastructure improvements to the hatchery and to implement management measures that meet TMDL allocations. The time schedule will include specific intermediate milestones with the final goal of meeting the Klamath TMDL allocations and targets. Intermediate milestones for pollutant reductions in the hatchery discharges may include:

1. Improving effluent water quality to the level of the intake water to the hatchery; and
2. Meeting current receiving water quality in the Klamath River at the point of discharge.

The hatchery may have the option of achieving some or all of its load reductions through offset mitigation if the potential changes to hatchery operations are limited in their ability to effectively reduce pollutant loads. Any offset mitigation would be coordinated through the Klamath River water quality improvement accounting and tracking program (see Section 6.7).

Implementation Measures

Regional Water Board:

Measure

- Revise NPDES Permit No. CA0006688 and WDR No. R1-2000-17 to require that the responsible parties implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet TMDL allocations and targets on a compliance schedule.

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Timeline

- December 2010

PacifiCorp and CDFG:

Measure

- Implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet the TMDL allocations and targets

Timeline

- As specified in the revised NPDES permit.

6.4 Implementation of Allocations and Targets - Tributaries and Coordination with Existing Klamath River Tributary TMDLs

The tributaries to the Klamath River include five major tributaries and numerous minor tributaries. The major tributaries are the Trinity, Salmon, Scott, Shasta and Lost Rivers. All the major tributaries, except the Lost River, join the Klamath River in California and are also wholly contained within California. The Lost River traverses the Oregon/California border three times and ultimately joins the Klamath River in Oregon via the Klamath Straits Drain. The major tributaries each have had technical TMDLs completed that are specific to the tributary basin. The Regional Water Board has adopted TMDL implementation plans for the Shasta, Scott, and Salmon River basins. The Trinity, South Fork Trinity, and Lost River basins have had TMDLs promulgated by the USEPA without associated implementation plans. Table 6.3 provides a summary of completed TMDLs and adopted implementation plans in the major tributaries.

Table 6.3: Completed TMDLs for the major tributaries of the Klamath River basin.

Subwatershed	TMDL(s)	Year	Agency
Lower Lost River	Nutrients and Biochemical Oxygen Demand (BOD)	Final Technical TMDL, 2008	USEPA
Shasta River	Temperature, dissolved oxygen	Final Technical TMDL and Implementation Plan, 2007	Regional Water Board
Scott River	Temperature, sediment	Final Technical TMDL and Implementation Plan, 2006	Regional Water Board
Salmon River	Temperature	Final Technical TMDL and Implementation Plan, 2005	Regional Water Board
Trinity River	Sediment	Final Technical TMDL, 2001	USEPA
South Fork Trinity River	Sediment	Final Technical TMDL, 1998	USEPA

This section discusses the approach to implementation specific to each of the major tributaries given existing TMDLs and implementation plans. The intent of the Klamath implementation plan is to make TMDL requirements as consistent as possible throughout the Klamath River basin.

6.4.1 Allocations and Targets

The Klamath River TMDLs assign nutrient and organic matter load allocations to all the major Klamath tributaries in California and 18 specified minor tributaries to ensure that water quality standards in the mainstem of the Klamath River are met. The nutrient and

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organic matter allocations for Klamath River tributaries in California are expressed as monthly mean concentrations, and are presented in Section 5.3.4.. The Shasta River is the only tributary in California that has an existing TMDL with nutrient and organic matter-related allocations. The Klamath River TMDL allocations to the Shasta River are consistent with the allocations assigned in the Shasta River TMDLs. Since the Lost River discharges to the Klamath River in Oregon, the allocations are included as part of ODEQ's Klamath River TMDLs and therefore are included in this TMDL through allocations and targets at stateline.

There are also two temperature-related load allocations and associated targets that apply watershed-wide, i.e. to the entire Klamath River watershed, including all tributaries, in California. These allocations and related targets are for excess solar radiation and human-caused discharges of sediment, and are presented in Section 5.2.1.

6.4.2 Implementation

The regulatory mechanisms to implement the tributary TMDL allocations and targets are summarized in Tables 6.1 and 6.2 and are the same as those detailed in Section 6.5 for the watershed-wide implementation actions. These implementation actions are necessary to meet the tributary and watershed-wide allocations and targets, and apply to the entire Klamath River basin in California, including the tributaries that have existing TMDLs. The following sections outline the existing tributary TMDL requirements and the necessary coordination in implementing the Klamath River TMDLs. The Lost River basin is discussed in more detail here because: (1) there is currently no implementation plan for the Lost River TMDL for California, (2) significant load reductions are needed to meet Klamath River water quality standards, and (3) TMDL implementation requires coordination with Oregon and federal agencies to meet the allocations at stateline.

6.4.3 Lost River

Historically the Lost River was only hydrologically connected to the Klamath River in years with extremely high flow. The Lost River was physically linked to the Klamath River when the Lost River basin was engineered to its current configuration in the early 1900s to accommodate the development of the Klamath Irrigation Project (KIP). The KIP diverts water from the Klamath River at four separate locations just downstream of Upper Klamath Lake. The KIP delivers water to approximately 200,000 acres of farmland (Figure 6.2). Of the total acreage of the KIP, approximately 70,000 acres are in California.. The Lost River originates in California, enters Oregon, flows through the Klamath Irrigation Project in Oregon and then into the Tule Lake National Wildlife Refuge (TLNWR) in California; the historical terminus of the Lost River. Water that accumulates in TLNWR is pumped through a tunnel into the Lower Klamath National Wildlife Refuge (LKNWR) to maintain farmland in the TLNWR, stabilize water levels in the Tule Lake sump, remove salt from the Tule Lake basin, and provide water to LKNWR. Drainage from LKNWR flows back across Oregon through the Klamath Straits Drain (KSD), which discharges into the Klamath River in Oregon. Return flows from the KIP are also discharged seasonally into the Klamath River through the Lost River Diversion Channel (LRDC) in Oregon. Based on the Klamath TMDL analysis, the current loading from the KSD comprises approximately 13 percent of the total

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phosphorus loading, 23 percent of the total nitrogen loading, and 40 percent of the organic matter loading in the Klamath River at stateline. While on a seasonal basis, the KIP diverts more nutrient and organic matter loads from the Klamath River than it returns to it, the KIP discharges contribute to exceeding the Klamath River water quality standards.

The principal sources of water inflows to the Lost River system in California are agricultural drains that collect irrigation return flows from privately owned agricultural lands within the KIP. The drains and canals are owned by USBR, but are operated by various irrigation districts that hold water delivery contracts with USBR. The KSD and LRDC are owned and operated by USBR, but receive pollutant inputs from upstream agricultural operators. All of Tule Lake and the open water areas of LKNWR are currently part of the National Wildlife Refuge system and are managed by U.S. Fish and Wildlife Service (USFWS). Some refuge lands are jointly managed by USBR for agricultural use.



Figure 6.2: The Lost River basin

The USEPA completed a technical TMDL for the Lost River basin in California in December 2008 (USEPA 2008), and the associated allocations are shown in Table 6.4. The Regional Water Board has not yet adopted an implementation plan for the Lost River basin in California.

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Table 6.4: Lost River, California TMDLs and Allocations by Segment.

Segment	Source	Dissolved inorganic nitrogen (DIN) (metric tons/yr)	Dissolved inorganic nitrogen (DIN) (average kg/day)	Carbonaceous biochemical oxygen demand (CBOD) (metric tons/yr)	Carbonaceous biochemical oxygen demand (CBOD) (average kg/day)
1	Lost River at Stateline Road (OR Border) Load Allocation	27.8	76.0	54.3	148.6
	Load Allocation for irrigation drainage loads to Lost River between Stateline Rd and Tule Lake Refuge	1.2	3.2	17.5	47.8
	Wasteload Allocation-CalTrans	0.1	0.3	0.2	0.5
Total	Lost River (from border to Tule Lake Refuge) TMDLs	29.0	79.5	71.9	197.0
2	Upstream load - from Lost River	29.0	79.5	71.9	197.0
	Load Allocation for irrigation drainage loads to Tule Lake Refuge	36.2	99.0	253.3	694.0
	Wasteload Allocation-CalTrans	0.1	0.3	0.2	0.5
	Wasteload Allocation City of Tulelake WWTP	1.0	2.7	3.5	9.6
Total	Tule Lake Refuge TMDLs	66.3	181.5	328.9	901.1
3	Upstream load - from Tule Lake Refuge ^a	19.4	53.2	245.9	673.7
	Load Allocation for irrigation drainage loads to Lower Klamath Refuge	3.9	10.7	39.4	107.8
	Load Allocation to Ady Canal	4.4	12.1	39.4	107.8
	Wasteload Allocation -CalTrans	0.1	0.3	0.2	0.5
Total	Lower Klamath Refuge TMDLs	27.8	76.2	324.8	889.9
4	Upstream load from Lower Klamath Refuge ^b	20.2	55.2	193.3	529.5
	Load Allocation for irrigation drainage loads to Klamath Straits Drain ^c	1.5	4.1	10.5	28.8
Total	Klamath Straits Drain (Stateline Highway to border) TMDLs	21.7	59.3	203.8	558.2

Source: USEPA 2008

^aUpstream load from Tule Lake Refuge—only a portion of the waters from Tule Lake Refuge are pumped to Lower Klamath Refuge. Additionally, the model assumes that Tule Lake Refuge is a single mixed segment; to avoid transferring uncertainties associated with the coarse spatial resolution to the next downstream segment, monitoring data collected at the D Pumping Plant intake was used as the basis for upstream inputs for this segment.

^bBecause the model assumes that Lower Klamath Refuge is a single mixed segment, water quality inputs to the next segment were based on monitoring data collected at Klamath Straits Drain at Stateline Highway.

^cIn comments on the draft Lost River TMDLs, USBR stated that the portion of the Klamath Straits Drain that exits the Lower Klamath Lake National Wildlife Refuge, and is within California, does not have any agricultural contributions. The table above is taken directly from the Lost River Basin TMDL, in California (USEPA 2008) and has not been altered.

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6.4.3.1 Responsible Parties in the Lost River

The parties responsible for implementing water quality control measures that meet the Lost River and Klamath River TMDL allocations in California include:

- US Bureau of Reclamation
- US Fish and Wildlife Service
- Tulalake Irrigation District
- Any party whose activities have the potential to contribute towards the TMDL impairments through the discharge of nutrients or organic material, the degradation of riparian conditions, or the discharge of excess sediment.

6.4.3.2 Implementation

Agricultural operators in the Lost River basin in California and Oregon have been implementing water quality control measures for a number of years. For example:

- The NRCS has funded approximately \$50 million in projects through the Environmental Quality Incentive Program; a program funded by the US Department of Agriculture (USDA). The funds were split evenly between projects in California and projects in Oregon.
- The Conservation Reserve Program (CRP), also funded by the USDA, pays for conservation easements to establish riparian buffers on agricultural land. In Oregon, this program is expanded and called the Conservation Reserve Enhancement Program to include active restoration of riparian areas.
- Water quality improvement projects have been implemented through the Oregon Water Enhancement Board.
- The Lava Beds/Butte Valley Resource Conservation District (RCD) in Tulalake and the Klamath Soil and Water Conservation District in Oregon are currently working to obtain funding through the Agricultural Water Enhancement Program.

Regional Water Board staff support and encourage the implementation of these on-going water quality protection measures. The Klamath TMDL implementation measures described in Section 6.5 apply to dischargers in the Lost River basin in California and, combined with the measures listed below, are sufficient to implement the Lost River TMDL in California. ODEQ will be developing the Lost River basin TMDL in Oregon and that TMDL will include allocations and implementation measures in Oregon. The allocations assigned to the KSD and LRDC are assigned as part of the Klamath River TMDLs in Oregon.

6.4.3.3 USBR/USFWS Proposed Management Agency Agreement

Regional Water Board staff proposes the development of a Management Agency Agreement (MAA) between USBR, USFWS and the Regional Water Board to implement the Lost River and Klamath River TMDLs. The MAA would be a voluntary and cooperative means of implementing the TMDL and would circumvent any dispute as to whether the Regional Water Board can enforce the TMDL load allocations against USBR. The MAA should include the following actions items:

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- Complete a water quality study to characterize the seasonal and annual nutrient and organic matter loading through the KIP and refuges. The study should be completed and inform the development of a water quality management plan to be submitted to the Regional Water Board within 18 months of approval of the TMDL;
- Based on the results of the water quality study, develop a water quality management plan to meet the Lost River and Klamath River TMDL allocations and targets. The plan should be submitted to the Regional Water Board for approval within 18 months of approval of the Klamath River TMDL.
- Include a schedule with interim milestones for meeting the TMDL allocations and targets;
- Coordinate implementation actions with other responsible parties discharging pollutants within the KIP and refuges;
- Develop a monitoring and reporting program with the Regional Water Board to evaluate the effectiveness of management measures and track progress towards meeting TMDL allocations and targets;
- Coordinate with the Klamath River water quality improvement accounting and tracking program in implementing offset projects; and
- Periodically report to the Regional Water Board on actions taken to implement the TMDL and progress towards meeting the TMDL allocations and targets.

6.4.3.4 Coordination with ODEQ and US EPA

As stipulated in the Klamath River and Lost River TMDL Implementation Memorandum of Agreement (MOA) developed by the Regional Water Board, ODEQ and US EPA Regions 9 and 10, the agencies agree to work jointly with common implementation parties, including USBR, USFWS, and the Klamath Water Users Association (KWUA) to develop effective implementation plans and achieve water quality standards. Regional Water Board staff suggest that USBR and USFWS develop the water quality management plan in conjunction with the development of an implementation plan to meet the Klamath River TMDLs in Oregon.

6.4.4 *Shasta River*

6.4.4.1 Responsible Parties

The parties responsible for meeting the Klamath TMDL allocations and targets in the Shasta River Basin are the same as those identified in the Shasta River TMDL Action Plan.

6.4.4.2 Implementation

The Klamath River TMDL analysis found that the load reductions called for in the Shasta River TMDL are sufficient to meet water quality standards in the Klamath River. The Shasta River TMDL Action Plan includes a goal to increase dedicated instream cold water flows by 45 cubic feet per second (cfs). Attainment of the Klamath River temperature TMDL, and associated temperature standards, requires achieving the Shasta River flow goal. The Shasta River TMDL Action Plan includes a conditional waiver of WDRs for parties discharging to the Shasta River basin as long as they comply with the

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Action Plan measures. The grazing and irrigated agriculture WDRs and/or conditional waivers proposed for development as part of the Klamath implementation plan (presented in Sections 6.5.5 and 6.5.6, respectively) will supersede the Shasta River basin conditional waiver when they are adopted. In the meantime, compliance with the Shasta River waiver is sufficient to meet the requirements of the Klamath River TMDL. Parties discharging sediment in the Shasta River basin must also comply with the prohibition on the discharge of excess sediment that is proposed as part of this Klamath River TMDL implementation plan (section 6.5.2).

6.4.5 Scott River

6.4.5.1 Responsible Parties

The parties responsible for meeting the Klamath TMDL allocations and targets in the Scott River Basin are the same as those identified in the Scott River TMDL Action Plan.

6.4.5.2 Implementation

The Scott River TMDL Action Plan includes sediment and temperature control measures, and it is anticipated that these measures are sufficient to meet the Klamath River TMDL watershed-wide temperature allocations and targets and are consistent with the proposed prohibition on the discharge of excess sediment. The Scott River TMDL recommended that the County of Siskiyou, in cooperation with other appropriate stakeholders, study the connection between groundwater and surface water in the Scott Valley. This study is currently underway. Attainment of the Klamath River temperature TMDL, and associated temperature standards, requires that this study move forward and that appropriate management practices are implemented following the study in order to ensure adequate flow in the Scott River.

The Klamath River TMDL assigns nutrient and organic matter allocations to the Scott River, and the Scott River Action Plan does not include measures to control discharges of these pollutants. Measures to control discharges of nutrients and organic matter from grazing and irrigated agriculture are discussed in the watershed-wide section of the Klamath River TMDL implementation plan (Sections 6.5.5 and 6.5.6, respectively). Parties conducting these activities in the Scott River basin are responsible for meeting the Klamath River TMDL allocations and targets and will be responsible for implementing measures to control the discharge of nutrients and organic matter consistent with the proposed grazing and irrigated agriculture WDRs and/or conditional waivers.

6.4.6 Salmon River

6.4.6.1 Responsible Party

USFS

6.4.6.2 Implementation

The USFS manages 97% of the land in the Salmon River basin, and the Regional Water Board passed a resolution in 2005 to develop an MOU with the USFS that would implement the Salmon River TMDL. The MOU is scheduled for signature by July 2009;

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before the anticipated adoption of the Klamath TMDLs. As discussed in Section 6.6 (Implementation on Federally Managed Lands) Regional Water Board staff are in the process of developing WDRs or a conditional waiver of WDRs to address all USFS discharges on federally managed lands in the Region, including the Salmon River basin. This waiver would incorporate the implementation measures agreed upon in the MOU and would require compliance with the Klamath TMDL allocations and targets.

6.4.7 Trinity River

6.4.7.1 Responsible Parties

The parties responsible for implementation in the Trinity River basin are the same as those associated with the various land use activities in the Klamath River basin as a whole and are identified in Section 6.5 of this implementation plan. In addition, the Bureau of Reclamation is identified here as the party responsible for implementing the Trinity River Restoration Project as described below.

6.4.7.2 Implementation

The USEPA completed sediment TMDLs for the South Fork Trinity River in 1998 and for the mainstem Trinity River in 2001. These USEPA promulgated TMDLs do not currently include implementation plans. This Klamath TMDL Action Plan serves as an action plan for temperature on the South Fork Trinity.

The primary adverse impacts associated with excessive sediment in the Trinity River pertain to anadromous salmonid fish habitat, which the Trinity River Restoration Program (TRRP) was designed to correct. The TRRP is a management program, headed by the Department of the Interior, to restore the fish and wildlife populations in the Trinity River basin to levels which existed prior to construction of the Trinity and Lewiston dams. The EPA cites implementation of the TRRP 2000 Record of Decision (ROD), including flow regime, mainstem/watershed restoration, and adaptive management, in its TMDL implementation recommendations. The Regional Water Board is in the process of developing a general permit for the restoration component of the ROD and considers its proposed permitting action on TRRP measures to be early TMDL implementation of the Trinity TMDL.

The Klamath River TMDL analysis used flows for the Trinity River that were specified in the ROD and signed by the US Secretary of the Interior and the Hoopa Valley Tribal Chairman. The TMDL analysis found that these flows are necessary to meet water quality objectives for water temperature in the mainstem Klamath River.

In addition to the watershed-wide temperature allocations and targets, the Trinity River is assigned nutrient and organic matter allocations in the Klamath River TMDL. The implementation measures described in Section 6.5 apply to the Trinity River watershed. Implementation of sediment and riparian control measures to meet the watershed-wide temperature allocations and targets applicable to the Trinity River are expected to be sufficient to meet the nutrient and organic matter allocations for the Trinity River.

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6.5 Implementation of Allocations and Targets – Watershed-Wide

This section discusses TMDL implementation for land use activities that occur throughout the Klamath River basin in California from nonpoint sources of pollution, and recommends implementation measures for various responsible parties to comply with the TMDL. The following land uses were identified as the primary nonpoint sources of pollution in the Klamath River basin that contribute to the water quality impairments:

- Road Construction and Maintenance;
- Grazing;
- Irrigated Agriculture; and
- Timber Harvest

After summarizing the watershed-wide allocations and targets (Section 6.5.1), this section presents watershed-wide prohibitions (Sections 6.5.2 and 6.5.3), and then addresses implementation measures associated with road construction and maintenance (Section 6.5.4), grazing (Section 6.5.5), irrigated agriculture (Section 6.5.6), and timber harvest (Section 6.5.7) land use activities separately. For each of the land use activities, the sections include an analysis of the efficacy of the current Regional Water Board regulatory strategy along with other water quality protection efforts in the basin. Recommendations are given for additional implementation measures staff believe to be necessary to effectively implement the TMDL. Section 6.6 then addresses implementation measures for all land use activities on federally managed lands.

Ultimately it is the Regional Water Board's goal to combine as many discharge requirements for various land use activities as comprehensively as possible into one permitting structure. Already some parties have requested that the Regional Water Board adopt ownership-wide WDRs for timber harvest companies operating within a large ownership within the Klamath River basin (i.e., Green Diamond). Ownership-wide WDRs have the advantage of being developed specifically for the lands within the ownership, and covering all activities within that area. Regional Water Board staff may work with companies to develop terms and conditions in the WDRs that meet TMDL requirements. Ownership-wide WDRs can also be coordinated with the landowner's other management plans and policies, such as Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs).

For temperature, specific shade and sediment-related allocations are identified in detail that will apply to most land use activities already regulated by a Regional Water Board permitting mechanism or scheduled for permitting in the near future. For example, site-specific shade potential requirements are already required for timber harvest activity enrolled under the timber waiver, and indirectly required through a general provision of the timber WDR, which requires compliance with the Basin Plan. Similarly, shade requirements will be implemented in any individual water quality certifications for specific projects under section 401 of the Clean Water Act. Shade requirements will apply to grazing and irrigated agriculture through the TMDL conditional waiver while the Regional Water Board develops permits for those activities. At this time, the Regional

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Water Board will not impose shade requirements on rural residential land use activities that do not otherwise require permitting by the Regional Water Board unless the activity is associated with another discharge of waste. Compliance with state and local regulations, general plans, and ordinances is critical to preventing water quality impacts from these activities (e.g. onsite wastewater treatment systems, grading and construction that results in soil disturbances of less than one acre of total land area, and residential pesticide and fertilizer use). The proposed prohibition on the discharge of excess sediment (Section 6.5.2) is intended to apply to all land use activity, including residential, unless already covered by an existing permitting mechanism.

6.5.1 Allocations and Targets

This section summarizes the watershed-wide allocations and targets.

6.5.1.1 Riparian Shade Allocations and Targets

The Klamath River TMDL assigns allocations and targets for riparian shade to limit water temperature increases due to solar radiation (Section 5.2.1). Land use activities in the Klamath River basin have the potential to degrade riparian conditions, and all parties are responsible for meeting the same riparian shade allocation. The following discussion is intended to clarify implementation of the riparian shade allocation and provide the basis for the implementation recommendations specific to each land use.

The riparian shade allocation requires the maintenance of the following *shade conditions*:

the shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire.

The allocation allows for site specific determination of shade potential in recognition that this potential is not equal in all locations. Shade conditions can be equated to the *effective shade* to the waterbody. Effective shade is defined as:

a measure of the percentage of total daily direct beam solar radiation that is blocked by vegetation or topography before reaching the ground or stream surface, taking into account the differences in solar intensity that occur throughout a day.

The process for assessing compliance with the Klamath River TMDL riparian shade allocation begins by comparing the current effective shade and the site potential effective shade. The site potential effective shade is designated as the riparian shade target in the TMDL. The TMDL provides general targets for effective shade based on the shade percentages that are expected to naturally occur for a given type of vegetation, aspect, and stream width. The effective shade curves in Figures 5.4, 5.5, and 5.6 represent the numeric targets for riparian shade within the Klamath River basin in California. The targets are intended as a guide for riparian management, and may be modified based on site-specific conditions.

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Each responsible party must implement management measures that attain and maintain site potential effective shade conditions. In simple terms, compliance with the shade allocation is achieved by not removing trees that provide shade to the waterbody. To accomplish this, it is recommended that responsible parties delineate a separate management area for riparian vegetation that has the potential to shade a waterbody, and manage these riparian areas differently than the surrounding land. These areas are referred to variously as a riparian management zone, streamside buffer area, or a watershed and lake protection zone. The riparian management area should be large enough to include any trees that have the potential to provide shade to surface waters once they reach their site potential height. In most cases, the landowner will not be required to actively restore riparian conditions by planting trees in order to comply with the TMDL. However, active restoration of riparian conditions may be required in instances where riparian vegetation has been removed and causes violation of the Basin Plan temperature standards and the Klamath River shade allocations and targets, or where natural vegetation is not readily becoming reestablished on its own. Regional Water Board staff acknowledge that it may be necessary in some cases to remove some riparian vegetation to hasten recovery towards site potential effective shade conditions.

6.5.1.2 Sediment Related Water Temperature Allocation and Targets

The TMDL found that sediment discharges in the Klamath River basin have a potential cumulative impact on water temperatures through the alteration of channel structure, particularly in the tributary basins. To control the impacts of excess sediment on water temperature, the Klamath River TMDL assigns the following temperature-related load allocation for human-caused discharges of sediment (Section 5.2.1.2):

Zero temperature increase caused by substantial human-caused sediment-related channel alteration.

Substantial human-caused sediment-related channel alteration is defined as:

A human-caused alteration of stream channel dimensions that increases channel width, decreases depth, or removes riparian vegetation to a degree that alters stream temperature dynamics and is caused by increased sediment loading.

The TMDL also identifies three targets related to the impacts of excess sediment:

1. 0 miles of substantial human-caused sediment-related channel alteration.
2. Less than 1% of all stream crossings divert or fail as a result of a 100-year or smaller flood.
3. A decreasing trend in road-related landslides.

6.5.2 Watershed-wide Prohibition on the Discharge of Excess Sediment

To help achieve these watershed-wide TMDL allocations and targets, the implementation plan includes a conditional prohibition that regulates excess sediment (waste) discharges from human related activities. The prohibition applies to all sediment sources in the Klamath River basin that are not regulated under a Regional Water Board adopted WDR

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or waiver. The prohibition is included so that the implementation plan complies with the State NPS Policy that requires the Regional Water Board to address all discharges of waste that can affect water quality, including non-point sources, by using some combination of WDRs, waivers, and/or prohibitions. This prohibition applies to land uses that contribute to the temperature impairment through the discharge of excess sediment. Sediment discharge sites would be regulated by this prohibition until the Regional Water Board adopts an alternative means of regulation, such as WDRs or waivers, as the implementation plan recommends for some categories of sediment discharges.

Prohibition on the Discharge of Excess Sediment:

- The discharge or threatened discharge of excess sediment from human caused activities to waters of the state is prohibited.
- Excess sediment is defined herein as soil, rock, and/or sediments (e.g., sand, silt, or clay) discharged to waters of the state in an amount that could be deleterious to beneficial uses or cause a nuisance.

This prohibition is intended to:

1. Encourage application of protective measures that will control the discharge of human-caused (anthropogenic) excess sediment and prevent the creation of new excess sediment sources;
2. Provide landowners a path they can follow to achieve compliance with the prohibition;
3. Provide Regional Water Board staff a framework to assess and respond appropriately to a discharge or threat of a discharge of excess sediment; and
4. Require responsible parties to systematically address excess sediment sources across their ownership.

Parties conducting land use activities that have the potential to discharge sediment are required to implement the following sequential compliance measures.

1. Prevent – Plan, design, and implement the project or activity in such a way that no excess sediment discharge occurs or could occur to waters of the state.
2. Minimize – If the discharge or threatened discharge of excess sediment cannot be fully prevented, then plan, design, and implement the project in such a way that discharges to waters of the state are minimized to the maximum extent possible.

Parties responsible for existing sediment sources must implement the following measures.

1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the sources.
2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.

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3. Schedule: Develop a schedule to implement the cleanup of controllable sediment discharge sites.
4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.
5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules until discharges are reduced to a level that meets the TMDL load allocations and water quality standards.

Landowners and land managers actively engaged in implementation of these measures will be considered on a path towards compliance with the prohibition. In cases where preventive or corrective action has not taken place, the Regional Water Board and/or staff will take the appropriate enforcement measures pursuant to the Statewide Enforcement Policy. Further, the NPS Policy allows the Regional Water Board the discretion to waive application or enforcement of the prohibition for a particular discharge based on the circumstances of the case.

6.5.3 Implementation Measures to Protect Thermal Refugia

Thermal refugia are typically identified as areas of cool water created by inflowing tributaries, springs, seeps or through upwelling hyporheic flow, and groundwater in an otherwise warm stream channel. Thermal refugia in the Klamath River basin are essential to the support of the cold water fishery because they moderate naturally elevated temperatures in the mainstem Klamath River. The refugia created by some tributaries in the Klamath River basin are typically in the plumes and pools of cold water that form in the mainstem at the tributary confluence. Refugia also exist in some tributary streams themselves. The Klamath River TMDL implementation plan focuses on protecting the critical function of thermal refugia in moderating mainstem Klamath River temperatures. There are four main influences on the function of thermal refugia addressed by the implementation plan:

- Temperature and flow of tributaries;
- Channel structure in and around the refugia;
- Discharges of sediment waste in and around the refugia; and
- Migration barriers preventing access to refugia.

6.5.3.1 Flow

Maintaining near natural flows in the Klamath River tributaries in California is an important component of meeting the Basin Plan water temperature objective. In particular, cold water flows are necessary to maintain the function of thermal refugia in the Klamath River basin. Regional Water Board staff will work with other state and federal agencies and tribes to identify and eliminate illegal diversions in the Klamath River basin in California. In addition, Regional Water Board staff recommend that the State Water Board staff issuing water rights permits to divert surface water in the Klamath River basin in California consider the impact of increased diversions on tributaries that provide thermal refugia.

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6.5.3.2 Prohibition of Discharge in and Around Known Thermal Refugia in the Klamath River Basin

To control the potential impacts of sediment discharges in and around thermal refugia, staff recommend a prohibition on discharges of waste within a defined *instream* buffer area in and around known thermal refugia in the Klamath River basin in California. The prohibition would apply only to discharges of waste that are not already regulated by other means. Suction dredging activities and activities that alter the stream bank are identified as having the potential to cause direct impacts to the function of refugia through sediment discharge. The implementation plan recommends the Regional Water Board continue to control the impact of stream bank alteration projects through its ongoing State 401 water quality certification program. For discharges associated with suction dredging activities, there is currently no regulatory mechanism in place. The prohibition on discharges in and around refugia would fill this gap in regulation and serve to implement the watershed-wide TMDL allocations.

Regional Water Board staff are addressing the impacts of suction dredging as a precautionary measure following the recommendation of fisheries biologists. Expert testimony by Dr. Peter Moyle (2006) concluded that:

Suction dredging represents a chronic unnatural disturbance of natural habitats that are already likely to be stressed by other factors and can therefore have a negative impact on fishes that use the reach being dredged. All anadromous fishes in the Klamath basin should be considered to be in decline and ultimately threatened with extirpation. Suction dredging, through a combination of disturbances of resident fish, alteration of substrates, and indirect effects of heavy human uses of small areas, especially thermal refugia, will further contribute to the decline of the fishes.

Dr. Moyle recommended protecting thermal refugia used by coho and other salmonid species by incorporating no-dredge buffers for varying distances around sources of cold water to the Klamath River system. A review by Harvey and Lisle (1998) of the impacts of suction dredging on streams made a similar concluding entreaty:

Considering the uncertainty surrounding dredging effects, declines in many aquatic animal populations, and increasing public scrutiny of management decisions, the cost of assuming that human activities such as dredging cause no harm deserves strong consideration by decision makers. Where threatened or endangered species exist, managers would be prudent to assume activities such as dredging are harmful unless proven otherwise).

Identification of Known Thermal Refugia in the Klamath River Basin in California

The shape and extent of refugia are highly variable and are dependent on stream geomorphology, riparian canopy, sediment dynamics, and flow. Regional Water Board staff recognize that there are a number of factors that can cause seasonal and inter-annual changes in the existence, location, and size of the thermal refugia in the basin. Taken as a

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whole, these thermal refugia comprise a network of support for populations of cold water fishes in the Klamath River basin. Therefore, staff are recommending that a prohibition on discharges of waste apply within a defined *instream* buffer area in and around all known thermal refugia in the Klamath River basin in California.

In order to identify the locations of known thermal refugia in the basin, Regional Water Board staff solicited information from fisheries biologists working in the Klamath River basin through a formal request in April 2009. Based on the information staff received, as well as review of the available reports on the topic, staff compiled a list of the known thermal refugia in the Klamath River basin in California (Table 6.5). Maps showing the locations of these creeks in the Klamath River basin are provide in Appendix 8.

Table 6.5: Tributaries to the Klamath River Known to Provide Thermal Refugia In and Around Their Confluence.

Tributaries		
Aikens Creek	Halverson Creek	Pine Creek
Aubrey Creek	Hopkins Creek	Portuguese Creek
Barkhouse Creek	Horse Creek	Red Cap Creek
Beaver Creek	Humbug Creek	Reynolds Creek
Blue Creek	Hunter Creek	Roach Creek
Bluff Creek	Ikes Creek	Rock Creek
Bogus Creek	Independence Creek	Rogers Creek
Boise Creek	Indian Creek	Rosaleno Creek
Boulder Creek ¹	Irving Creek	Sandy Bar Creek
Cade Creek	Kelsey Creek ¹	Salt Creek
Camp Creek	King Creek	Seiad Creek
Canyon Creek ¹	Kohl Creek	Slate Creek
Cappell Creek	Kuntz Creek	Stanshaw Creek
Cheenitch Creek	Ladds Creek	Swillup Creek
China Creek	Little Horse Creek	Ten Eyck Creek
Clear Creek	Little Humbug Creek	Thompson Creek
Coon Creek	Little Grider Creek	Thomas Creek
Crawford Creek (Humboldt Co.)	Lumgrey Creek	Ti Creek
Crawford Creek (Siskiyou Co.)	McGarvey Creek	Titus Creek
Dillon Creek	Mill Creek	Tom Martin Creek
Doggett Creek	Miners Creek	Trinity River
Dona Creek	McKinney Creek	Tully Creek
Donahue Flat Creek	Nantucket Creek	Ukonom Creek
Elk Creek	Negro Creek	Ullathorne Creek
Elliot Creek	Oak Flat Creek	Walker Creek
Empire Creek	O'Neil Creek	West Grider Creek
Fort Goff Creek	Pecwan Creek	Whitmore Creek
Grider Creek	Pearch Creek	Wilson Creek

¹ Scott River tributary

Size of the Instream Buffer Area

Instream buffer areas located in and around the mouths of the tributaries that create refugia in the mainstem Klamath River are recommended. Two buffer areas are recommended within the wetted channel of the Klamath River; one upstream and one downstream of the tributary confluence providing thermal refugia. A third buffer area is

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recommended in the wetted channel of the tributary stream providing thermal refugia, located upstream of the tributary confluence with the Klamath River. These three buffer areas are assigned different lengths based on the potential impacts of instream activities such as suction dredging within that area. Figure 6.3 shows a generic tributary/river confluence with the different instream buffer areas delineated.

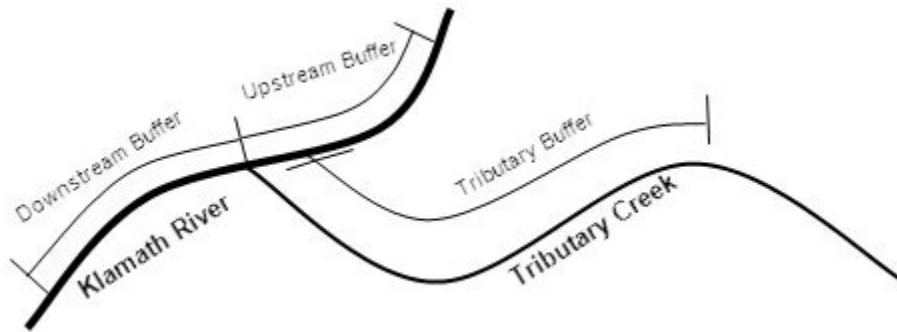


Figure 6.3: Conceptual diagram of proposed buffers in and around the confluence of a tributary providing thermal refugia.

Regional Water Board staff recommend a default buffer where no site-specific information is available regarding the spatial extent of the refugia. Where site-specific information is available, an extended buffer is recommended. Regional Water Board staff referenced a thermal infrared study of the Klamath River basin conducted in August 2003 to identify creeks where a more extensive buffer is appropriate (Watershed Sciences 2004). The study showed the spatial dimensions and water temperatures of cold-water refugia in the mainstem Klamath River. Staff also considered information submitted in response to the April 2009 solicitation.

The buffer length that extends downstream of the tributary confluence is sized to protect cold water plumes that form in the Klamath River where tributaries enter the mainstem river. Most thermal refugia formed by cold water plumes are located within 300 feet of the tributary confluence. Adding a margin of safety to this distance, staff recommend an instream buffer of 500 feet from the tributary confluence in the downstream direction. The responses Regional Water Board staff received from the April 2009 solicitation identified a number of refugia locations where a buffer of 500 feet would not be sufficient to protect the refugia from impacts of instream activities such as suction dredging. For these refugia, staff are recommending a 1500 foot buffer. The tributaries where a 1500 foot buffer is recommended include: Aubrey, Beaver, Clear, Dillon, Elk Creek, Grider, Horse, Indian, Rock, Swillup, Thompson, and Ukonon (See Appendix 8).

To protect the refugia from activities upstream of the tributary confluence, the buffer needs to be large enough so that instream activities such as suction dredging have a negligible impact on the function of the refugia downstream. Suction dredging can create plumes of sediment that usually settle out downstream within 300 ft. Adding a margin of safety to this distance, Regional Water Board staff recommend a buffer area of 500 feet

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where discharges from suction dredging would be prohibited in the Klamath River upstream of tributary confluences where known refugia exist.

The portion of the tributary that is just upstream of the tributary mouth can function either as a water supply for the cold water plume in the mainstem, or it can function as a thermal refuge itself. The functions provided by the tributary depend partially on whether fish have physical access to that tributary. If the tributary itself is the refugia, the buffer should extend at least as far as the thermal refuge area within the tributary. To protect the tributaries that provide cold water refugia, staff recommend a prohibition on discharges from suction dredging activities within the lower 500 feet of the tributary. As with the buffer extent in the downstream direction in the Klamath River, the fisheries biologists that responded to the April 2009 solicitation identified a number of tributaries known to provide refugia for fish. To protect these tributaries from the potential impacts of instream activities such as suction dredging, it is recommended that the buffer be extended to 3000 feet within the tributary upstream of its confluence with the mainstem river. The following is a list of tributary creeks that Regional Water Board staff recommend be provided this added protection: Aubrey, Beaver, Clear, Dillon, Elk Creek, Empire, Fort Goff, Grider, Horse, Indian, King, Little Horse, Little Humbug, Mill, Nantucket, O'Neil, Portuguese, Reynolds, Rock, Sandy Bar, Seiad, Stanshaw, Swillup, Thompson, Ti and Titus (See Appendix 8).

6.5.3.3 Coordination with the Department of Fish and Game

The California Department of Fish and Game (CDFG) administers a permit for suction dredging activities in the Klamath River basin. In May 2009, the State Senate passed a bill (SB 670) requiring the CDFG to temporarily halt issuance of all suction dredge mining permits. Senate Bill 670 prohibits the use of suction dredge mining equipment in rivers and streams that provide critical habitat to spawning salmon and steelhead until the CDFG updates its suction dredge rules so they comply with CEQA. The State Water Board currently working cooperatively with the CDFG to formulate general statewide regulations and/or guidelines for dredge operators. The Klamath River TMDL implementation plan supports this process as the means to address the impacts of suction dredging activities, and Regional Water Board staff recommends that CDFG incorporate the prohibition on sediment discharges in and around known thermal refugia locations into the revised permit. Regional Water Board staff will evaluate the revised permit and will consider at that time whether any further measures are necessary to protect water quality. If the permit is sufficient, the Regional Water Board may certify CDFG's program pursuant to the State NPS Policy.

6.5.4 Road Construction and Maintenance

The road networks in the Klamath River basin contribute to elevated temperatures in tributary watersheds through the discharge of excess sediment. The implementation plan requires parties responsible for construction and maintenance of roads in the Klamath River basin to implement measures that meet the TMDL allocations and targets. The road-related TMDL targets (Section 5.2.1.2) are measurable and will be used to track the progress of implementation in the basin.

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6.5.4.1 Responsible Parties

All parties responsible for the construction and maintenance of roads.
Modoc, Del Norte, Humboldt, Siskiyou, and Trinity Counties.
California Department of Transportation (CalTrans).

6.5.4.2 Existing Regulatory Structure

The Regional Water Board currently has the following regulatory mechanisms in place:

- Discharges from roads associated with a timber harvest plan (THP) or NTMP are regulated through the Regional Water Board's existing WDRs and waivers of WDRs as described in Section 6.5.7. Existing plans used to meet the TMDL requirements may need to be updated so they meet the applicable watershed-wide allocations and targets.
- Discharges from state highways managed by Caltrans are regulated through a statewide NPDES permit. This permit should be updated to include a sediment inventory and control plan, migration barrier plan and riparian shade allocations.
- Any road construction over one acre must enroll in the state-wide construction stormwater permit, which functions similarly to a nonpoint source permit by requiring BMPs and other management measures designed to reduce runoff and erosion. The State Water Board is in the process of updating the construction permit.
- A water quality certification pursuant to section 401 of the Clean Water Act must be obtained from the Regional Water Board by anyone proposing to conduct a project that requires a federal permit. The most common trigger for a 401 water quality certification is the federal Section 404 US Army Corp of Engineers permit that is required of anyone who proposes an activity that would discharge dredged or fill material into waters of the United States. The 404 permit applies to roads in the Klamath River basin not associated with silviculture or agriculture, which are specifically exempted. All other road construction and/or maintenance projects in and around stream channels in the Klamath River basin are required to apply for this 404 permit. Regional Water Board staff routinely require water quality protection measures in certifying these types of projects.

The construction of roads that involves less than one acre of land disturbance, as well as routine maintenance of existing roads, including county roads, roads outside of a THP or NTMP, roads associated with grazing and irrigated agriculture, and rural residential roads in the Klamath River basin, are currently not regulated by the Regional Water Board.

6.5.4.3 Implementation to Address Road-Related Discharges on Private Lands

Most roads located on private lands in the Klamath River basin are associated with timberland ownerships, however roads associated with other land uses, such as agriculture, also exist as do a significant number of rural residential roads. In order to comply with the TMDL, landowners are responsible for implementing effective management practices to address nonpoint source pollution from roads on their property. Staff recommend that sediment discharges from roads on private lands be regulated through the proposed prohibition on discharges of excess sediment in coordination with

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existing plans and programs. Measures to address road-related discharges will also be incorporated into any land use specific WDRs and waivers proposed as part of this implementation plan such as those proposed for grazing activities and irrigated agriculture. Regional Water Board staff encourage the larger landowners in the Klamath River basin that are responsible for maintaining a significant road network on their land to work with staff to develop ownership-wide WDRs that meet the TMDL requirements on a programmatic level. One of the benefits of ownership-wide WDRs is that they may be developed with input from regulated entities to consider site-specific conditions within the ownership and existing road management plans.

Implementation Measures for Private Roads in the Klamath River Basin

Responsible Parties: Measure

- For discharges from roads not regulated through WDRs or a waiver of WDRs, implement the management measures consistent with the prohibition on the discharge of excess sediment to meet TMDL allocations and targets.

Measure

- For roads that are part of a timber harvest plan or NTMP area, implement an erosion control plan as required by the WDRs and waivers for timber harvest on nonfederal lands.

6.5.4.4 Implementation Measures to Address County Roads

Humboldt, Siskiyou, Trinity, Modoc and Del Norte Counties are responsible for maintaining their county roads at a level that meets the TMDL allocations and targets. One mechanism to address sediment discharges from county roads is the development of WDRs and/or a waiver of WDRs for discharges from county roads in the Klamath River basin. The WDRs/waiver would require counties to implement measures similar to those required by the proposed prohibition on the discharge of excess sediment while incorporating existing county road programs such as the Five Counties Salmonid Conservation Program described below. The WDRs/waiver should describe county road maintenance and construction activities, establish discharge prohibitions, and require monitoring and reporting to track compliance. The WDRs/waiver could be done individually for each county or could be developed as one region-wide permit.

Existing County Roads Program

Five counties in the North Coast Region, four of which are in the Klamath River basin, have already initiated a unified program that addresses sediment discharges on county roads. In 1997, the Counties of Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity agreed to form the Five Counties Salmonid Conservation Program (5C Program) in response to federal Endangered Species Act listings of salmon species as 'Threatened'. The program objectives include: "identify(ing) potential problem sites through systematic inventories of fish passage barriers and potential erosion sources on County maintained roads (Five Counties Salmonid Conservation Program 2009)." The 5C Program follows a process similar to the process outlined in the proposed prohibition on the discharge of excess sediment and includes inventorying road-related sediment sources and

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implementing management practices to address those sources. The program has made considerable progress, and as of 2007, more than 2113 miles of county roads have been inventoried within the five counties. In consultation with state and federal agencies, the 5C Program has also developed *A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds* (5C Manual, Five Counties Salmonid Conservation Program 2002). The 5C Manual prescribes management practices for both routine and emergency repair and maintenance of county roads, bridges and related facilities. Regional Water Board staff support the 5C Program as an effective means for achieving the TMDL load allocations and targets.

The 5C Manual contains a protocol for developing County Road Sediment Source Inventories of portions of county roads in order to set priority locations for erosion and sediment control efforts. The resulting Direct Inventory of Roads and Treatments (DIRT) provides a useful database for the counties' road departments to track progress in treating priority sites and associated sediment savings. The 5C Manual includes implementation and effectiveness monitoring and requires an annual report that summarizes the counties' self-evaluation of the effectiveness of its road maintenance BMPs in protecting water quality and stream habitat. Not addressed in the 5C Manual is the construction, or a major expansion or change in use, of such roadways and facilities beyond those which existed previously.

The Regional Water Board staff recommend certifying the 5C Program, with accompanying waivers, as a suitable nonpoint source program because it contains measures adequate to meet the TMDL allocations and water quality standards. The certification process and accompanying waiver will include a monitoring plan, conditions that require trackable progress, and a provision setting forth that the certification and WDRs/waiver must be revoked if the program is found to be not adequately implemented, not achieving its goals, or is no longer adequate to restore water quality. To receive coverage under the waiver and certified 5C Program, each county must certify its intent to comply with the 5C program or otherwise indicate its intention to participate. This can be accomplished by acceptance and implementation of the 5C Manual by the County Board of Supervisors as a CEQA-exempt project, or an agreement with the Director of Public Works to abide by the practices in the 5C Manual. The certification and waiver will not cover activities that otherwise require coverage under a different permit including the state-wide construction stormwater permit for new construction, or projects that require water quality certification under section 401 of the Clean Water Act. In the alternative, a county may submit a report of waste discharge and the Regional Water Board will process a WDR for county roads. This may be an option for Modoc County, which is not one of the five counties participating in the 5C Program.

Implementation Measures for County Roads

Regional Water Board:

Measure

- Certify 5C and adopt accompanying waiver

Timeline

- Upon TMDL adoption

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Measure

- In the event that a county does not show intent to implement 5C, develop Waste Discharge Requirements or a waiver of WDRs

*Responsible Parties -
Counties:*

Measure

- For Siskiyou, Humboldt, Del Norte and Trinity Counties, implement measures through the Five Counties Salmonid Conservation Program.

Measure

- For Modoc County, implement management measures consistent with the prohibition on the discharge of excess sediment (Section 6.5.2).

6.5.4.5 California Department of Transportation

In the Klamath River basin within California, Caltrans has jurisdiction over segments of three state highways: State Route 96, State Route 169, and State Route 299. There are also two segments of the federal transportation system that Caltrans manages and maintains within the Klamath River basin in California: U.S. Interstate Highway 5 and U.S. Interstate Highway 101. Discharges of waste from Caltrans' facilities are regulated by the State Water Board under the NPDES Permit for Caltrans (Order No. 99-06-DWQ and NPDES No. CAS000003), adopted on July 15, 1999. The State Water Board is in the process of revising the Caltrans NPDES permit with input from the Regional Water Boards.

The Klamath implementation plan requires Caltrans to implement management practices that meet the watershed-wide allocations and targets. The Scott and Shasta TMDL implementation plans also address discharges from Caltrans facilities and require the Regional Water Board to evaluate the adequacy of the Caltrans NPDES permit. Since the permit is being revised, there is an opportunity to incorporate TMDL measures for all three TMDLs into the permit based on the Regional Water Board's evaluation. The Klamath implementation plan makes three recommendations concerning Caltrans facilities; the first addresses the control of excess sediment discharges and should be incorporated into the revised NPDES permit, the second addresses riparian shade allocations which should be incorporated into the revised NPDES permit and considered in 401 water quality certifications, and the third addresses barriers to migratory fish passage. The recommendations are described below.

Recommended Implementation Measures for Caltrans

The technical TMDL analysis identified Caltrans facilities as contributing to the TMDL impairments through the discharge of excess sediment (e.g. eroding shoulders, failed culverts, and unstabilized cut and fill slopes). Regional Water Board staff recommend that Caltrans implement the process outlined in the proposed prohibition (Section 6.5.2) to control the discharge of excess sediment from its facilities and comply with the

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TMDL. Staff also recommend that the Regional Water Board work with the State Water Board to incorporate this measure into the Caltrans NPDES permit.

Senate Bill 857 (Kuehl 2005), enacted into law effective January 1, 2006, requires Caltrans to prepare a yearly report describing its efforts to assess and remediate the negative impacts of state highway or road structures that serve as barriers to migratory fish passage. This mandate is consistent with the goals of the implementation plan to protect and provide access to thermal refugia in and around the mouths of tributaries to the mainstem Klamath River. There are several barriers to migration along Highway 96 caused by undersized culverts and the presence of the highway. To address these barriers, Regional Water Board staff recommend that Caltrans fully assess all barriers to migration caused by its road and highway facilities along the Klamath mainstem. If the inventory determines that any Caltrans facilities block or impede fish passage, a priority ranking and time schedule for modifying fish passage barriers to accommodate free passage of fish upstream and downstream should follow. The priority ranking should consider the extent to which a migratory barrier is affecting access to known thermal refugia along the mainstem Klamath River.

Implementation Measures for Caltrans Facilities

State Water Board: Measure

- Incorporate the following measures into the Caltrans NPDES permit:
 1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s).
 2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.
 3. Schedule: Develop a schedule to implement the cleanup of controllable sediment discharge sites.
 4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.
 5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules until discharges are reduced to a level that meets the TMDL load allocations and water quality standards.
- Incorporate riparian shade allocation into the Caltrans NPDES permit and 401 water quality certifications.
- Incorporate migration barrier inventory and remediation requirements under SB857.

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Timeline

- The revised statewide Caltrans NDPES permit shall be adopted by the State Water Board by April 2010, with USEPA adoption anticipated by August 2010

Caltrans:

Measure

- Implement the measures outlined above to control the discharge of excess sediment from their facilities and comply with the Klamath TMDL allocations and targets, even if measures are not incorporated into the statewide permit.

Measure

- Fully assess all barriers and potential barriers to migration caused by Caltrans road and highway facilities along the Klamath mainstem. Develop a priority ranking and time schedule for modifying the identified fish passage barriers to accommodate free passage of fish upstream and downstream. The priority rank should consider the extent to which a given tributary functions as a thermal refugium in the Klamath River mainstem.

Timeline

- Caltrans shall submit an annual report to the Regional Water Board documenting measures taken to address fish passage barriers caused by its facilities.

6.5.5 Grazing

Grazing activities in the Klamath River basin have the potential to contribute to TMDL impairments mainly through erosion, alteration of riparian functions, and discharge of nutrients and organic matter. Grazing on nonfederal lands in California occurs mostly in the tributary basins in the upper middle reach of the Klamath River from Scott River to Iron Gate dam, including the Scott and Shasta River basins, and in the Lost River basin that drains into the Klamath River in Oregon. The Regional Water Board currently does not regulate grazing activities in the Klamath River basin, except through waivers of WDRs adopted as part of the Scott River and Shasta River TMDL Action Plans or through an NPDES permit if an operation is classified as a concentrated animal feeding operation (CAFO). To control nonpoint sources of pollution from grazing activities consistently throughout the Klamath River basin, to comply with the State NPS Policy, and to meet the watershed-wide and tributary TMDL allocations and targets, staff recommend the development of a Klamath River basin-wide conditional waiver of WDRs and/or general WDRs for grazing for consideration by the Regional Water Board. A conditional waiver of WDRs and/or general WDRs for grazing would not apply to CAFOs already regulated through an NPDES permit. To comply with the Klamath River watershed-wide and tributary specific load allocations and targets, any party conducting grazing activities in the Klamath River basin must select and implement management practices that control sediment sources, protect and maintain riparian functions, and address discharges of nutrients and organic matter.

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6.5.5.1 Responsible Parties

Any party conducting grazing activities in the Klamath River basin in California.

6.5.5.2 Implementation

Protection and Maintenance of Riparian Shade

Parties conducting grazing activities within the Klamath River basin in California are responsible for protecting and maintaining riparian conditions that meet the riparian shade allocation and targets. This allocation requires that riparian shade to a stream be maintained where it exists, and that grazing activities not impede progress towards reaching site potential effective shade conditions.

Control of Sediment Discharges

The prohibition on the discharges of excess sediment (Section 6.5.2) will apply to sediment discharges from grazing activities until a conditional waiver of WDRs and/or general WDRs for grazing are developed for the Klamath River basin. The prohibition as well as a conditional waiver of WDRs and/or general WDRs for grazing will require those responsible parties discharging sediment to survey all sediment sources on their land and then systematically implement management practices to control those sources pursuant to a time schedule.

Control of Nutrient and Organic Matter Discharges

To control discharges of nutrients and organic matter from animal waste deposited to surface waters, Regional Water Board staff recommend including, as a condition of eligibility for general WDRs or a waiver, that responsible parties implement measures to limit livestock access to the stream channel. This recommendation is not intended to prohibit use of surface waters for livestock watering, but rather eliminate the direct discharge of nutrients and organic matter to surface waters in the Klamath River basin.

Ranch Water Quality Management Plans

Responsible parties shall develop a ranch management plan to organize their implementation efforts. Ranch water quality management plans may be required as part of the conditional waiver of WDRs and/or general WDRs for grazing and may be required at any time by the Regional Water Board's Executive Officer. Landowners may choose to implement measures from an existing plan, develop their own plan, or implement measures from a plan that is developed as a group. If an existing plan is to be used, it is the responsibility of the landowner to ensure the plan complies with the TMDL allocations and targets and that additional measures are included if needed. The ranch water quality management plan should include the management practices selected by the landowner(s) to comply with the TMDL and also include elements such as:

- A description of the existing beneficial uses to be protected from grazing activities;
- A survey of sediment sources on the ranch, including roads, and a time schedule for implementing measures to address those sediment sources as required by the prohibition on the discharge of excess sediment;

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- An inventory of riparian vegetation conditions, and a plan to monitor progress towards meeting the watershed-wide riparian shade allocation and targets;
- Nutrient and organic matter control measures including limiting livestock access to the stream channel; and
- Tracking and effectiveness monitoring of pollution control practices selected for implementation.

Implementation Measures

Regional Water Board:

Measure

- Develop general WDRs and/or a conditional waiver of WDRs for grazing activities in the Klamath River basin for Regional Water Board consideration. The waiver would require compliance with the existing TMDL load allocations in the Scott and Shasta River basins in addition to the watershed-wide temperature and nutrient allocations in the Klamath River basin.

Timeline

- December 2013

Responsible Parties- Any party conducting grazing activities in the Klamath River basin in California:

Measure

- Protect and maintain site potential effective shade conditions

Measure

- Control sources of sediment as required by the prohibition on the discharges of excess sediment and compliance with the forthcoming conditional waiver of WDRs and/or general WDRs for grazing

Measure

- Develop and implement nutrient and organic matter control measures including limiting livestock access to the stream channel

Measure

- Develop a ranch water quality management plan to implement the TMDL on a prioritized schedule or implement measures through an existing plan.

Timeline

- 1 year from USEPA adoption of the TMDL

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6.5.6 Irrigated Agriculture

Activities associated with irrigated agriculture have the potential to contribute to water quality impairments through discharges of polluted irrigation tailwater and by degrading riparian conditions. Irrigated agriculture occurs in the Klamath River basin in California mostly in the tributary basins in the upper middle reach of the Klamath River from Scott River to Iron Gate dam, including the Scott and Shasta River basins, and in the Lost River basin that drains into the Klamath River in Oregon.

6.5.6.1 Responsible Parties

Any party conducting activities associated with irrigated agriculture in the Klamath River basin in California including irrigated pastures.

6.5.6.2 Implementation

The Regional Water Board currently does not regulate irrigated agriculture activities in the Klamath River basin, except through waivers of WDRs adopted as part of the Scott River and Shasta River TMDL implementation plans. To control nonpoint sources of pollution from irrigated agriculture activities consistently throughout the Klamath River basin in California, to comply with the State NPS Policy, and to meet the watershed-wide and tributary TMDL allocations and targets, staff recommend the development of a Klamath River basin-wide conditional waiver of WDRs and/or general WDRs for irrigated agriculture for consideration by the Regional Water Board. The basin-wide conditional waiver of WDRs and/or general WDRs for irrigated agriculture would succeed the existing waivers in the Scott and Shasta River basins.

Staff recommend that a Klamath River basin-wide conditional waiver of WDRs and/or general WDRs for irrigated agriculture provide landowners the option of complying with the waiver or WDR individually or as part of a group compliance program. Group compliance programs could be coordinated by a local RCD or other local group. As part of a group program, the individual's responsibility would be to implement best management practices (BMPs) that control discharges resulting from irrigated agriculture activities, comply with the prohibition on the discharge of excess sediment, and meet the TMDL allocations and targets for shade, nutrients, and organic matter. Management measures should focus on maintaining and restoring riparian vegetation, road management to control sediment discharges, and controlling irrigation tailwater quality.

Water Quality Management Plans

Responsible parties conducting activities associated with irrigated agriculture in the Klamath River basin shall develop water quality management plans to organize their implementation efforts. Water quality management plans may be required as part of the conditional waiver of WDRs and/or general WDRs for irrigated agriculture and may be required at any time by the Regional Water Board's Executive Officer. Landowners may choose to implement measures from an existing plan, develop their own plan, or implement measures from a plan that is developed as a group. If an existing plan is to be used, it is the responsibility of the landowner to ensure that the plan complies with the TMDL allocations and that additional measures are included if needed. The water quality

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management plan should include the management practices selected by the landowner(s) to comply with the TMDL and may include elements such as:

- A description of the existing beneficial uses to be protected from activities associated with irrigated agriculture;
- A survey of sediment sources and a time schedule for implementing measures to address those sediment sources as required by the prohibition on the discharge of excess sediment;
- Development of a nutrient management plan to control the application of fertilizers;
- Implementation of control measures to reduce or eliminate irrigation tailwater discharges that contain elevated nutrient, organic matter, and temperature loads;
- Tracking and effectiveness monitoring of pollution control practices selected for implementation.

Implementation Measures

Regional Water Board:

Measure

- Adopt WDRs and/or a conditional waiver of WDRs for activities associated with irrigated agriculture, including irrigated pastures used for grazing, by December 2012. The WDRs/waiver of WDRs will consider the existing load allocations in the Shasta and Scott River basin TMDLs and will take the place of the waivers in those basins.

Responsible Parties-

Any party conducting activities associated with irrigated agriculture in the Klamath River basin in California:

Measure

- Control sources of sediment as required by the prohibition on the discharge of excess sediment and forthcoming conditional waiver of WDRs and/or general WDRs for irrigated agriculture;

Measure

- Implement control measures to reduce or eliminate irrigation tailwater discharges that contain elevated nutrient, organic matter, and temperature loads

Measure

- Develop a water quality management plan to implement the TMDL on a prioritized schedule or implement an existing plan.

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6.5.7 Timber Harvest

Timber harvest activities can impact water temperature and can contribute to dissolved oxygen and nutrient water quality impairments. The Klamath River TMDL implementation plan focuses on controlling sediment and protecting riparian functions from timber harvest activities to meet the watershed-wide TMDL allocations and targets. Timber harvest on nonfederal lands is currently regulated by the Regional Water Board through a combination of general WDRs (Order No R1-2004-0030) and a conditional waiver of WDRs (Order No R1-2004-0016). The existing general WDRs and waiver contain a requirement that all provisions of the Basin Plan must be met to qualify for enrollment in the WDRs or waiver. By amending the Basin Plan through adoption of the Klamath River TMDL Action Plan, the existing general WDRs and waiver will implement the TMDL load allocations. The recommendations made in the end of this section are consistent with the existing WDRs and conditional waiver of WDRs for timber harvest activities on nonfederal lands.

6.5.7.1 Responsible Parties

Regional Water Board

Any party conducting timber harvest activities in the Klamath River basin

6.5.7.2 California Department of Forestry and Fire Protection Forest Practice Rules

Timber harvest on nonfederal lands is also subject to the requirements of the California Department of Forestry and Fire Protection *Forest Practice Rules* (FPRs), including the *Threatened and Impaired Rules* (a subset of the FPRs that applies to CALWATER planning watersheds where populations of anadromous salmonids that are listed as threatened, endangered, or candidate under the State or Federal Endangered Species Act are currently present or can be restored) (CDF 2009). The planning watersheds where these rules apply may exclude some areas of the Klamath River basin. Regional Water Board staff recommend that the Klamath implementation plan require compliance with the *Threatened and Impaired Rules* throughout the basin, as was required by the Scott and Shasta TMDL implementation plans. While Regional Water Board staff support the FPRs as being consistent with TMDL implementation, FPRs may not be protective enough to meet the watershed-wide allocations. To address this gap, staff have identified the following additional requirements necessary for timber harvest activities to comply with the Klamath River TMDL:

1. maintenance of riparian vegetation that meets the riparian shade allocation, and
2. timber harvest restrictions in Class III streams to prevent alteration to channel structure.

6.5.7.3 Maintenance of Riparian Vegetation that Meets the Riparian Shade Allocation

For the protection of riparian shade, the Klamath River TMDL gives a temperature load allocation related to riparian shade. Regional Water Board staff have translated this temperature allocation into minimum timber harvest prescriptions for riparian areas. Proposed timber harvest activities on nonfederal lands in the Klamath River basin that have the potential to degrade riparian conditions must meet these requirements to comply with the Klamath River TMDL. Alternative prescriptions that provide equal or better

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protection may be proposed for consideration by Regional Water Board staff as part of the timber harvest plan or NTMP review process. If no alternatives are proposed, the party conducting timber harvest activities is responsible for meeting the minimum requirements described below. These requirements are consistent with the proposed conditional waiver of WDRs for timber harvest activities on nonfederal lands.

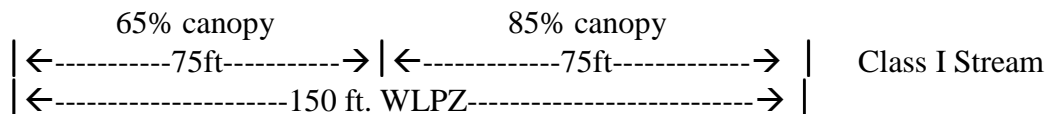
Process for determining prescriptions for timber harvest of riparian vegetation

To determine the appropriate prescription for harvest of riparian vegetation, the responsible party first must determine the current condition of the riparian vegetation in the THP or NTMP area by measuring the current overstory canopy shade percentages. These percentages are compared to the following reference shade conditions established by the Regional Water Board as being compliant with the TMDL.

Reference Shade Conditions

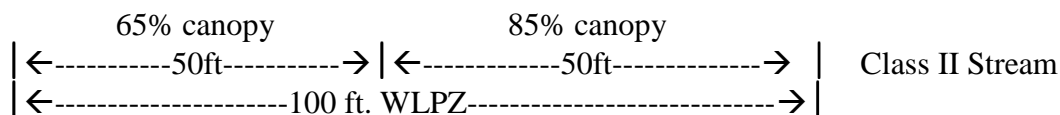
For Class I streams in the Klamath River basin:

85% overstory canopy within the first 75 feet of the Watercourse and Lake Protection Zone (WLPZ) or streamside protection zone and 65% overstory canopy for the remaining 75 ft.



For Class II streams in the Klamath River basin:

85% overstory canopy within the first 50 feet of the WLPZ or streamside protection zone and 65% overstory canopy for the remaining 50 ft.



Whether the existing shade canopy percentages are greater than or less than the above reference conditions determines which of the following requirements apply:

Where the existing overstory canopy is greater than the reference condition

Timber harvest activities shall not reduce the overstory canopy below the reference conditions.

Where the existing overstory canopy is less than the reference conditions, or when the majority of trees (greater than 50%) are below their full site potential height

All trees that are providing shade to a Class I or Class II stream during the critical summer months (June-September), including trees outside of the WLPZ or streamside buffer zone, shall be retained. Any shade tree to be retained outside the WLPZ shall be marked as a 'leave tree'. A solar pathfinder or similar device shall be used to determine whether or not a tree is providing shade to the waterbody during the critical summer months.

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Additional measures to protect Class III Streams

Regional Water Board staff have determined that the current FPRs including the *Threatened and Impaired Rules* do not provide adequate protection for Class III streams to meet the TMDL load allocations. Class III streams are streams with no aquatic life present that show evidence of being capable of sediment transport to Class I and II streams. Usually this refers to ephemeral streams with little or no flow in the summer. The FPRs do not require a WLPZ or streamside buffer where timber harvest is limited adjacent to and within Class III streams. Erosion and sediment delivery can result if removing trees within the channel of a Class III stream destabilizes the channel. Staff recommend that no timber harvest activities occur within the channel zone of a Class III watercourse (as defined in the FPRs), except for use and maintenance of roads and crossings. This recommendation is consistent with the existing conditional waiver of WDRs for timber harvest activities on nonfederal lands.

Implementation Measures

Regional Water Board:

Measure

- Work with timber companies (at their request) to develop ownership-wide WDRs that are compliant with the TMDL load allocations.

Parties conducting timber harvest activities on nonfederal lands:

Measure

- No timber harvest activities occur within the channel zone of a Class III watercourse within the Klamath River basin, except for use and maintenance of roads and crossings.

Measure

- Implement riparian management measures that meet the riparian shade allocations by implementing process described above to determine the appropriate harvest prescriptions, or by proposing alternative prescriptions for Regional Water Board staff approval.

Measure

- Implement the *Threatened and Impaired Rules* (CDF 2009, section 916) watershed-wide in the Klamath River basin.

6.6 TMDL Implementation on Federally Managed Lands

The US Forest Service (USFS) and the BLM separately manage public lands in the Klamath River basin. The USFS manages over half of the total acreage in the Klamath River basin in California on four National Forests: Six-Rivers, Klamath, Shasta-Trinity, and Modoc. Land use activities on USFS lands that were identified in the Klamath River

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TMDL as potentially contributing to the TMDL impairments include but are not limited to timber harvest, grazing, and road construction and maintenance. BLM manages small, isolated areas of land in the Klamath River basin in California,

Aside from a waiver of WDRs for USFS timber harvest activities, the Regional Water Board does not currently have a regulatory mechanism in place to implement the watershed-wide allocations and targets on federal lands in the Klamath River basin in California. To ensure all discharges are regulated as required by the State NPS Policy, Regional Water Board staff recommend that the Regional Water Board adopt some combination of WDRs and/or waiver(s) of WDRs for all USFS activities on federal lands. The permitting mechanism will be coordinated with exiting USFS plans and programs that address water quality in the Klamath River basin. This section first describes these plans and programs and then describes the TMDL implementation measures recommended by Regional Water Board staff that would be incorporated into the proposed WDRs/waivers. Regional Water Board staff are already meeting with USFS staff to discuss the development of the proposed WDRs/waivers.

6.6.1 Responsible Parties

Regional Water Board

US Forest Service

US Bureau of Land Management

Parties conducting timber harvest activities on federal lands under the terms of a timber harvest sale contract.

Parties conducting grazing activities on federal lands in designated grazing allotments.

6.6.2 USFS Plans and Policies

The USFS follows several policy documents and administrative rules in its management of federal lands that address water quality concerns. The guiding policy for USFS water quality management at the statewide level in California is the *Water Quality Management for Forest System Lands in California, Best Management Practices* (USFS 2000) guidance document developed jointly by the State Water Board and the USFS. The USFS also follows the federal *Northwest Forest Plan* (USFS 1994b) standards and guidelines, and the *Aquatic Conservation Strategy*. The National Forests have incorporated this policy direction into their forest level *Land and Resource Management Plans* (USFS 1994a, USFS 1994b, USFS 1994c, and USFS 1995). While Regional Water Board staff support these plans and policies as viable implementation vehicles, there is also an expectation that the plans be revised as necessary to comply with the TMDL. Staff will work with the USFS to implement these programs to meet TMDL allocations and targets.

6.6.2.1 State Water Board and USFS guidance document

In 1981, the State Water Board and the USFS entered into a Management Agency Agreement (MAA) in which the USFS agreed to implement management practices that protect water quality on USFS lands in California. In 2000, the USEPA and State Water Board developed performance standards for meeting water quality standards in the *Water Quality Management for Forest System Lands in California, Best Management Practices*

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(USFS 2000) guidance document. The performance standards described in this document for different categories of land use are called ‘Best Management Practices’. This terminology is slightly confusing because the document refers to performance standards as ‘Best Management Practices’ (BMPs) that are met through the implementation of appropriate management practices, whereas the term ‘BMP’ usually refers to the practices themselves. For example, in the guidance document, “BMP 2-7 ‘Control of Road Drainage’ dictates that roads will be correctly drained to disperse water runoff to minimize the erosive effects of concentrated water flow” (USFS 2000). This is a performance standard that must be met through the implementation of on-the-ground practices that are not specified in the document, such as the installation of rolling dips or road outslipping. The USFS forms interdisciplinary teams to select the appropriate practices that meet the performance standards based on an assessment of project site conditions.

6.6.2.2 Northwest Forest Plan

The Northwest Forest Plan (NWFP) was adopted by the USFS in 1994 and is currently being implemented by the National Forests in the Klamath River basin. The mission of the NWFP is to adopt coordinated management direction for the lands administered by the USFS. The Northwest Forest Plan Record of Decision (USFS 1994b) presents a combination of land allocations and “Standards and Guidelines” for the management of those allocations. While the Standards and Guidelines consider more than just water quality protection, the NWFP also includes the Aquatic Conservation Strategy (ACS) that specifically focuses on water quality. Regional Water Board staff support the objectives of the ACS as consistent with the objectives of Klamath TMDL implementation. The ACS can be found at: <<http://www.reo.gov/library/reports/newsandga.pdf>> (page B-9).

6.6.2.3 Land and Resource Management Plans

The USFS forest-level planning documents are called Land and Resource Management Plans (LRMPs). Each National Forest in the Klamath River basin has their own LRMPs that guide their land management activities. Shortly after the NWFP went into effect, the National Forests updated their LRMPs to incorporate the new Standards and Guidelines and the ACS. The LRMPs also incorporate the State Water Board and USFS guidance document described above. The Regional Water Board staff support the implementation of the LRMPs as a means to achieve the watershed-wide allocations and targets. The Regional Water Board will work with the USFS to update their LRMPs as necessary.

6.6.3 Implementation Measures

Regional Water Board:

Measure

- Develop a conditional waiver of WDRs specific to each National Forest in the Klamath River basin that regulates all activities on USFS lands that have the potential to impact water quality.

Timeline

- The development of the conditional waivers will have a different timeline specific to each National Forest as follows:

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-Klamath National Forest – December 2011
-Shasta-Trinity National Forest- December 2012
-Six Rivers National Forest – December 2013

USFS:

Measure

- Implement management practices that meet the Standards and Guidelines required by the Northwest Forest Plan (USFS 1994b) and meet the objectives of the Aquatic Conservation Strategy.

Measure

- Implement the latest edition of the applicable Land and Resource Management Plan and any subsequent revisions given they are at least as stringent as the current requirements.

6.6.3.1 Timber Harvest on Federally Managed Lands

Currently, the Regional Water Board regulates timber harvest on federal lands through a conditional waiver of waste discharge requirements (Order No R1-2004-0015). This waiver expired in March 2009 and will be revised for renewal by the Regional Water Board by December 2009. To be eligible for the existing waiver, the USFS must include water quality control practices from the *Water Quality Management for Forest System Lands in California, Best Management Practices* (USFS 2000) guidance document and conduct an analysis of the cumulative effects of the project. The cumulative effects analysis uses one or more models to determine whether the proposed project will raise the local watershed above a predetermined ‘threshold of concern’. If the watershed is found to be above the threshold, or the project will put the watershed over the threshold, the USFS is required to implement a monitoring plan for the project. The monitoring plan should be developed to track TMDL compliance; this implementation plan recommends specific monitoring measures in Chapter 7. The waiver also contains a provision that makes TMDL allocations and targets enforceable upon Regional Water Board adoption of a TMDL implementation plan.

USFS Water Quality Guidance Document

The ‘BMPs’ or performance standards for timber harvest activities are organized into the following categories: timber management, road and building site construction (related to timber harvest), vegetation manipulation, fire suppression and fuels management, and watershed management. For every USFS timber harvest project, an interdisciplinary team conducts an onsite evaluation of the project area to identify the applicable performance standards and appropriate management practices. The guidance document establishes the means for implementing the selected practices on the ground. “The appropriate BMPs, and the methods and techniques of implementing the BMPs, are included in the environmental documentation, permit, contract, or other controlling document used to conduct and administer the project” (USFS 2000).

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Implementing this process for each USFS timber harvest project is essential to meeting TMDL requirements, and Regional Water Board staff recommend that the USFS include the selected practices in their project document prepared pursuant to the National Environmental Policy Act (NEPA). The selected management practices must also be included in the timber sale contract or other controlling document used to administer the project as stated in the guidance document. Regional Water Board staff will review the NEPA document and any other controlling documents to ensure that the management practices proposed by the USFS meet the TMDL allocations and targets. Regional Water Board staff will continue to coordinate TMDL implementation with the USFS through the existing waiver of WDRs for timber harvest on federal lands and will also include TMDL measures in the revised waiver that will be considered by the Regional Water Board as scheduled for December 2009. There is no need for additional implementation measures at this time. Regional Water Board staff will also work with the USFS to track progress towards meeting the watershed-wide targets and allocations.

Implementation Actions

Regional Water Board:

Measure

- Continue to regulate nonpoint sources of pollution from timber harvest activities on federally managed land through the Categorical Waiver for Discharges Related to Timber Harvest Activities on Federal Lands Managed by the USFS in the North Coast Region (Resolution R1-2004-0015) or its successor.

USFS:

Measure

- Implement management practices that meet the performance standards contained in *Water Quality Management for Forest System Lands in California, Best Management Practices* guidance document. The selected practices shall be included in the timber harvest project document prepared pursuant to the National Environmental Policy Act (NEPA), the timber sale contract, and/or other controlling documents used to administer the project.

Timeline

- As timber harvest projects are developed.

6.6.3.2 Grazing on Federally Managed Lands

Grazing on federal lands principally takes place in the Klamath and Shasta-Trinity National Forests on designated grazing allotments. The allotments have been in use since the early 1900's and are mostly located in high mountain meadows closer to the headwaters of Klamath River tributaries. Grazing is managed by the USFS through the development and implementation of individual Allotment Management Plans (AMPs). Every year, the USFS develops Annual Operating Instructions (AOIs) for each allotment to implement the AMPs based on the current conditions of the allotment. Ranchers

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grazing animals on federal lands are required to follow the AOIs as well as meet the overall AMP objectives in order to continue grazing the allotment.

USFS/State Water Board Guidance Document

The agreement on performance standards between the USFS and the State Water Board serves as the basis for controlling water quality impacts from grazing. An interdisciplinary team determines the management practices included in the AMP following an onsite evaluation of the project area. Regional Water Board staff are supportive of this process as a means to meet the TMDL allocations as long as the AOIs are effective and enforceable. The ‘BMPs’ or performance standards for grazing activities on federal lands identified in the guidance document include the following:

- *Range Analysis and Planning:* The district ranger is responsible for the analysis of range allotments and the preparation of AMPs. The permittee is expected to carry out the AOIs under the immediate direction and supervision of the district ranger.
- *Grazing Permit System:* Field checks and measurements will be made annually by the USFS. The grazing permit will be modified, cancelled or suspended in whole or part as needed to ensure proper use of the range resource and protection of other resources, such as water quality.
- *Rangeland Improvements:* The grazing allotment analysis may indicate the need for certain rangeland improvements such as further protection of sensitive areas, stream channel stabilization measures or water developments. The district ranger will assure that the permittee is involved as a cooperator in rangeland improvements (USFS 2000).

The LRMP for the Klamath National Forest gives the following goals for grazing management that are consistent with TMDL implementation (USFS 1994a):

1. Manage vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock, wildlife and wild horses. Manage vegetation to provide for a desired condition of herbaceous shrub and forested vegetation according to site potential and resource needs.
2. Manage grazing activities to not retard or prevent attainment of the Aquatic Conservation Strategy objectives.

Regional Water Board staff recommend that the USFS meet the above performance standards in their project document prepared pursuant to the National Environmental Policy Act (NEPA) as part of Klamath TMDL implementation. The management practices selected to meet the performance standards must be included in the grazing AMP, AOIs, and other controlling document(s) used to manage the allotment. Grazing activities on federal lands will be addressed as part of the WDRs/waivers for all activities being proposed as part of this implementation plan.

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Implementation Actions

Regional Water Board:

Measure

- Include TMDL measures for grazing activities that meet TMDL allocations and targets in conditional waivers of WDRs for all activities on federal lands.

Timeline:

- For each forest as described in Section 6.6.3.

USFS:

Measure

- Include the management practices that will be used to meet TMDL allocations and targets in the project document prepared pursuant to the National Environmental Policy Act (NEPA), the Allotment Management Plan, Annual Operating Instructions and/or other controlling document(s) used to manage grazing allotments on federal lands.

Measure

- Update current AMPs to meet TMDL allocations and targets by adapting management measures as needed

Measure

- The Regional Water Board Executive Officer may require a monitoring plan for a particular grazing allotment to track implementation of management measures and/or assess impacts to water quality.

6.6.3.3 Road Management on Federally Managed Lands

The USFS is responsible for managing well over 10,000 miles of roads on federal lands within the Klamath River basin on four National Forests. This extensive road network has been identified in the Klamath technical analysis as contributing to the TMDL impairments. The water quality impacts of roads are described in Section 5.2.1.2. The Klamath Implementation Plan focuses on road management in the Klamath, Six Rivers, and Shasta-Trinity National Forests.

The Regional Water Board does not currently have a mechanism that comprehensively regulates discharges from roads on federal lands. To fill this gap, staff recommend that road management be included as one of the activities covered by the conditional waiver of WDRs for federal lands. The waiver should require the USFS to inventory and address sources of sediment from roads across its ownership; similar to the process outlined in the proposed prohibition on the discharge of excess sediment (Section 6.5.2). This approach is also consistent with existing USFS programs to inventory and assess roads on federal lands. Existing programs should be coordinated with TMDL implementation and compliance with the proposed waiver.

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Matching Road Maintenance Needs to Available Funding

To address the impacts of roads on water quality, Regional Water Board staff recommend that the USFS be required to reduce their road maintenance needs to match available funding. The National Forests have been directed by the USFS Road Management Policy (USFS 2001) to assess the status of the road network on National Forest lands and to minimize the network to the extent feasible. Part of the reason for this is that the National Forests, including those in the Klamath River basin, do not have adequate funding for maintenance of the current road network. In the Shasta-Trinity National Forest, for example, only 20% of the roads are maintained to design standards, and as of 2002, there was a \$76 million backlog of deferred maintenance (USFS 2002b). Without proper maintenance, roads have a higher probability of failing and contributing sediment that can alter stream temperatures. Regional Water Board staff support the USFS Road Management Policy and encourage the USFS to reduce road densities on federal lands through road decommissioning. Reducing road density has the added benefit of increasing infiltration, which can add base flow to Klamath River tributaries. Regional Water Board staff recognize that decommissioning roads is not always the most prudent use of available road maintenance funds. As part of TMDL implementation, Regional Water Board staff recommend that each National Forest submit annual reports on measures taken to reduce maintenance needs for road networks given the limitations of the maintenance budget.

The implementation plan also recommends the following implementation measure to address the need for federal agencies to reconcile their available resources with their road maintenance needs:

- The total road mileage a party is responsible for managing should be reduced as needed so that road maintenance may be funded at a level where existing and future sediment sources from roads can be adequately addressed.

State Water Board and USFS Guidance Document

The guidance document describes 28 'BMPs' or performance standards that must be met to control nonpoint source pollution from roads on federal lands. The BMPs address aspects of road management such as planning, erosion control, slope stability, stream crossing installation, riparian management, maintenance, decommissioning, and others. Klamath River TMDL implementation requires the selection and timely implementation of the appropriate management practices that meet the BMP performance standards in the guidance document. Staff recommend that the proposed waivers of WDRs for all activities on federal lands include a requirement to meet the performance standards described in the guidance document.

USFS Road Management Policy

The National Forests are directed to reduce the impacts of roads on natural resources in the USFS Road Management Policy and the Northwest Forest Plan (section 6.6.6.2). The National Forests in the Klamath River basin are responding to this directive by assessing sediment sources and threats to water quality on National Forest land and implementing road restoration and decommissioning projects as funding permits. This existing

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assessment and prioritization process is consistent with the requirements of the Regional Water Board prohibition on the discharge of excess sediment and can be used to comply with the Klamath River TMDLs. The Regional Water Board will work with the USFS to ensure their efforts are consistent with TMDL implementation and water quality standards. The following are descriptions of the existing road management programs in each of the National Forests.

Existing Road Management in the Klamath National Forest

The Klamath National Forest (KNF) staff have developed the *Klamath National Forest Forestwide Roads Analysis* (USFS 2002a) that addresses road impacts to natural resources and guides the restoration actions related to roads. KNF staff have conducted Road and Sediment Source (RSS) inventories in the following watersheds: Elk, Indian, Irving, Ti, Clear, Dillon, upper Beaver, Grider, and Horse Creeks, and the Salmon and Scott Rivers. The RSS inventories identify “specific locations where road drainage structures and fill have the potential to adversely impact watershed processes, then assess the relative environmental risk of each site” (USFS 2002a). The completed inventories and sediment source ratings are used to prioritize road restoration projects in the KNF. KNF has implemented fixes on the top 10% of sediment sources identified in the RSS assessments. Road management measures are recommended as part of watershed levels analyses. Once Environmental Assessments for the analyses are completed, KNF will begin implementing road maintenance measures based on funding and priority.

Existing Road Management in Six Rivers National Forest

The Six Rivers National Forest staff analyze the road network by ranger district. *The Orleans Roads Analysis and Off-Highway Vehicle Strategy* (USFS 2006) (Orleans RAP) recommends road management measures in the Orleans Ranger District; the only Six Rivers district in the Klamath River basin. The Orleans RAP tiers to the *Six Rivers National Forest Roads Analysis*, which is a forest-level plan for roads. Where the forest-level plan only evaluates passenger car roads of Maintenance Levels 3-5, the Orleans RAP evaluates high clearance roads (Levels 1-2) and non-system roads in the forest. The findings of the Orleans RAP can be used to develop a prioritization strategy for road restoration work in the Orleans Ranger District. The analysis identified the following items that relate to controlling the impacts of sediment from roads in the Orleans Ranger District:

- needed and unneeded roads,
- site-specific priorities for improvements and decommissioning, and
- roads associated with environmental risk (USFS 2006).

Projects to implement the RAP will be funded based on availability of grants and data from the roads analysis. The Regional Water Board staff will work with the Six Rivers Forest staff on prioritization of road restoration work that will address the impacts of sediment on Klamath River tributaries and thermal refugia in the mainstem Klamath River.

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Existing Road Management in Shasta-Trinity National Forest

The Shasta-Trinity National Forest staff completed their forest-level roads analysis in July 2002 entitled the *Shasta-Trinity National Forest Roads Analysis Report* (USFS 2002b). This forest-level analysis evaluates passenger car roads of Maintenance Levels 3-5 and makes recommendations regarding road maintenance needs and prioritization. High clearance roads (Levels 1-2) and non-system roads are evaluated in watershed-level analyses that tier to the forest-level analysis.

Implementation Measures

Regional Water Board:

Measure

- Include TMDL measures for road management that meet TMDL allocations and targets in the proposed waivers of WDRs for all activities on federal lands.

Timeline

- As provided above for the development of conditional waivers of WDRs for all activities on federal lands specific to each National Forest.

USFS:

Measures

- Implement the elements of the proposed prohibition on the discharge of excess sediment described in Section 6.5.2.
- Submit a list of prioritized sediment control sites and a time schedule for completing the necessary work. Submit annual progress reports thereafter.
- Reduce road mileage to reduce the potential development of sediment sources by matching road maintenance needs with available resources.
- annual progress reports on measures taken to reduce the road network and reduce road densities. The report shall include a discussion of funding levels and maintenance needs.

Timeline

- As designated in the conditional waivers specific to each forest.

6.6.3.4 Fire Management on Federally Managed Lands

Wildfires are common during the summer in the Klamath River basin and can lead to severe impacts on water quality through the destruction of riparian vegetation and increased runoff and erosion rates. The fire regime in the Klamath River basin has been altered through years of suppression that has resulted in increased fuel loads and fire severity. The USFS carries out timber harvest projects related to fire management both to control fuel loads and to salvage timber after a fire. The Regional Water Board's current waiver for timber harvest activities on federal lands covers these projects. The USFS also takes measures to control erosion after a wildfire that focus on maintenance of drainage features and revegetation if needed. The practices for controlling post fire

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erosion sources are, in most cases, the same as those used to control erosion sources on forestlands with the added consideration of increased runoff volume. Regional Water Board staff recommend that the waiver that addresses all activities on federal lands include measures that address post fire sediment sources. The following are the types of management measures that can be taken to comply with the TMDL:

- Hydrologically disconnect firelines;
- Remove all temporary crossings;
- Improve the existing road drainage system to handle post-burn flows;
- Clear blockages to restore drainage function;
- Remove minor slumps and slides where needed;
- Ensure the function of drainage systems after storm events; and
- Implement post fire revegetation on severe burns areas (an area where duff and overstory canopy consumption has occurred) considering steep slopes that statistically receive high rainfall as a priority. Burned areas that receive snow are less likely to cause erosion problems.

Regional Water Board:

Measure

- Include measures to address post fire sediment sources in the proposed waiver of WDRs for all USFS activities on federal lands.

6.7 Klamath River Water Quality Accounting and Tracking Program

Regional Water Board staff, in coordination with ODEQ, US EPA, and PacifiCorp, have begun developing a Klamath River basin water quality improvement accounting and tracking program (KlamTrack Program). The Klamath River basin has several attributes that could benefit from a water quality improvement accounting and tracking program. This program will provide a record of individual actions and, perhaps, the basis for a market that facilitates a higher level of activity and collaboration than could be achieved by a regulatory approach alone. These attributes include:

- A large, geographically complex watershed that straddles two states, six tribes and two EPA regions thus requiring a framework for project collaboration that extends beyond the jurisdiction of any individual participant;
- Numerous and diverse sources of water quality impairments that vary widely in costs and feasibility of control strategies;
- Significant influence of nonpoint sources of pollutants, particularly from upstream sources in the basin, on water quality throughout the basin;
- The presence of dams that are under consideration for removal in the relatively near future thus reducing the desirability of long-term investments in reducing their near-term water quality impacts; and
- A large number of regulatory programs with overlapping goals and drivers that would benefit from coordinated action.

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The KlamTrack Program provides a mechanism that would allow for collaboration among basin stakeholders on common projects while earning credit towards their regulatory requirements related to TMDLs and other mandated programs (e.g., AIP interim measures, state and federal Endangered Species Acts).

6.7.1 Program Goals

The overall program goals are to provide a program to achieve water quality improvements required in all Klamath Basin TMDLs, in a manner that is consistent with state and federal policy and regulations, is technically sound, and is tailored to meet the specific needs and conditions in the Klamath Basin. More specifically, the goals are to develop a basinwide accountability program to track water quality improvements, facilitate planning, and coordinate TMDL implementation based upon a market-like system. The KlamTrack Program should also:

- Provide a decision tool to guide expenditure of implementation resources towards projects with greatest/earliest impact.
- Encourage the pooling of resources to support centralized solutions and enable the spending of resources across state boundaries by accounting and tracking the contribution of each project participant.

6.7.2 Program Objectives

Establish and operate a program for tracking water quality improvements that:

- Encourages early reductions and progress towards water quality improvements;
- Reduces the cost of TMDL implementation through greater efficiency and flexible approaches;
- Creates economic incentives for innovation, emerging technology, voluntary pollutant reductions from all sources, and for potential trading and/or offsets amongst these sources;
- Achieves ancillary environmental benefits beyond the required reductions in specific pollutant loads, such as the creation and restoration of wetlands, floodplains and fish and/or waterfowl habitat;
- Establishes an accountability Program whereby a common metric (or sets of metrics) is/are used for estimating and tracking water quality improvements;
- Establishes a credible baseline, linked to the two states' TMDLs, and incorporates effectiveness monitoring and an adaptive management approach;
- Uses standardized protocols to quantify pollutant loads, load reductions, and credits / offsets, or other water quality improvements (e.g., stream channel restoration) that contribute to supporting conditions for beneficial uses;
- Recognizes cross-pollutant benefits (e.g. acknowledges that upstream nutrient reductions can improve downstream low dissolved oxygen levels and algal bloom conditions); and
- Allows participants to contribute to program-sponsored projects without having to develop partner-specific agreements or contracts thus minimizing administrative and transaction costs.

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6.7.3 Next Steps

Regional Water Board staff are committed to the continued development and implementation of a water quality improvement accounting and tracking program, as stipulated in the Klamath River and Lost River TMDL Implementation MOA signed by the Regional Water Board, ODEQ, and US EPA Regions 9 and 10. The Regional Water Board has received federal funding to hire a contractor to work closely with PacifiCorp's contractors and support the Regional Water Board, ODEQ, and EPA in developing the KlamTrack Program. Regional Water Board staff plan to coordinate with stakeholders interested in the KlamTrack Program in 2010.

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